GuideTRAX V3

User Manual

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GuideTRAX V3 User Manual

Written for GuideTRAX Version 3

Publication Date, May 2005

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1

Introduction

GPS guidance systems allow agricultural machinery to be far more productive by providing accurate and real time information for vehicle navigation and placement of product. Specifically the RINEX guidance systems provide an easy to use interface through the colour touch screen for vehicle guidance. The system may be used for any agricultural task which requires vehicle navigation, particularly for applications or treatment of chemicals and/or fertilisers and seeds.

Treated areas can be seen on the screen as the vehicle is working, providing a continuous guidance display with additional information relating to the field and treatment. The RINEX guidance system records information until it is manually cleared so operations can be interrupted if necessary, and completed at a later date.

The GuideTRAX software has been developed by RINEX primarily for vehicle guidance in agricultural applications. In addition to this the GuideTRAX software can be configured for control of automated steering systems and/or automated boom section control.

The GuideTRAX software has evolved over many years and the release of GuideTRAX version 3 (V3) software heralds a new era with the addition of field planning and data management modules to further enhance the guidance software.

The V3 software is configured for three different user levels. The system, depending upon purchase is either configured as a HL, HT, or HR version. The versions and their characteristics are discussed in further detail in their relevant sections.

RINEX design and manufacture the Saturn guidance systems operating the GuideTRAX software. As time progresses advancements are made with the hardware and new models are released. Wherever possible the software is deigned to operate on earlier hardware systems and this manual will provide information specific to earlier hardware systems as necessary.

Accordingly this manual is specifically designed to assist users of the Saturn guidance systems in the operational use of the GuideTRAX V3 software.

1.1 This Manual

This manual is designed for use with the Saturn “H” series of guidance systems as manufactured by RINEX Technology (RINEX). The “H” guidance system series include the following models;

- SATURN HL
- SATURN HT
- SATURN HR

A feature of the Saturn “H” series is that each model has similar operating characteristics, however the different models offer different options to suit individual requirements. This manual is designed to assist users with the operation of the V3 software with the user’s “H” system.

As the different systems have different features enabled some sections of this manual will not be relevant to every system. In these cases the following symbols will denote that the paragraph or entire section is not applicable to the particular system.

Whenever the No Entry to HL symbol is displayed it will denote that the particular paragraph or entire section is not applicable to the HL version.

Whenever the No Entry to HT symbol is displayed it will denote that the particular paragraph or entire section is not applicable to the HT version.

As the HR software contains advanced record management functionality it is beyond the scope of this manual to describe the operation of the HR software. The HR system is supplied with an additional user manual, Part Nō 1-1243.

This manual will refer to buttons which appear on the screen. The screen is touch sensitive, which means that the system is operated by touching the buttons on the screen. The user should touch the button on the screen with their finger to select the button.

This manual will adopt the following conventions when describing the selection of a button or a series of buttons in order to access a particular function or section of the program.

A button on the screen refers to icons or images that appear on the screen. An example of a button is shown in Figure 1-1.

Figure 1-1 The FIELD button

FIELD Refers to the FIELD button as illustrated in Figure 1-1.

When it is necessary to locate a particular part of the V3 program by touching a number of buttons this will be referred to as “Access” and show the necessary buttons to touch in order to access the function starting from the Main Menu.

Access: **SETUP** **FARMS** **ADVANCED** **REGISTER**

1.2 The Saturn Series

RINEX manufacture a variety of guidance and control systems, including the Saturn series of guidance systems. The series has evolved over the years as development in computer technology has also evolved.

A brief listing of the models available in the Saturn series and their specifications is provided in Appendix 2.

GuideTRAX V3 software was designed specifically to operate on the Saturn “H” series which incorporates an intelligent power supply with an embedded Windows® operating system.

The Saturn “H” series guidance systems automatically control the power position according to the vehicle ignition status which means that the guidance system is operational when the vehicle is running and inactive (OFF) when the vehicle is shutdown.

The predecessor to the Saturn “H” series was the “G” series which incorporated different physical functionality. GuideTRAX V3 has been adapted to operate on the “G” series with some minor differences which are denoted in this manual where necessary.

Primarily the only difference that the user will note is the powering of the system. Whereas the “H” series incorporated the intelligent power supply which senses the status of the vehicle ignition, the “G” series must be manually switched ON and OFF.

1.3 GuideTRAX V3 series

GuideTRAX V3 is designed to provide one easy to use interface which can accommodate different user requirements as necessary. RINEX recognise that many users want their systems to grow with their requirements, which is exactly how GuideTRAX V3 is designed to operate. A user can purchase an “entry level” system that can be expanded to accommodate more advanced data management features in the future. The following sections describe the features and assets of each version of GuideTRAX V3.

1.3.1 Saturn HL Version

The HL version of GuideTRAX V3 is designed as an “entry level” guidance system. The HL incorporates the same guidance functions as found on the standard version, including parallel, racetrack and contour guidance. Furthermore it provides the same functionality for vehicle modelling as found in the standard version and allows for many optional features to be added to the system.

Primarily the HL is designed for lower accuracy applications and accordingly is supplied with a GPS receiver to match these requirements. Hence the functions which require higher GPS accuracy are not functional on the HL which includes AutoSPRAY and AutoSTEER functions. Furthermore the HL will not allow the user to permanently save fields to removable memory, although the virtual memory will still allow the user to have nine active fields which are stored in onboard memory.

The HL can be upgraded to either the Saturn HT or HR model.

1.3.2 Saturn HT Version

The Saturn HT version of GuideTRAX V3 is designed for the user who requires an easy to use guidance system, which can include automated steering and automated boom section control. The HT provides the user with the most advanced guidance functions provided on any system throughout the world. The user can choose and swap between parallel or “lock” guidance in any field with the touch of a button.

The HT can operate with any level of corrected GPS positioning and as such is perfect for the most accurate applications using a dual frequency RTK positioning system to a sub-metre differential correction service. The HT can be configured with AutoSPRAY and AutoSTEER (optional modules) or most other RINEX peripherals.

The HT can be upgraded to the Saturn HR model.

1.3.3 Saturn HR Version

The Saturn HR version of GuideTRAX V3 is designed for the user who requires meticulous record management functions with a guidance system. The HR incorporates all of the guidance functionality of the HT and expanding its features further for controlled traffic farming with the management of field records and associated guidance points.

Furthermore the HR has the ability to import entire farm plans and record accurate applications applied in the field which can then be transferred back to the office and farm management software.

This manual is not designed to cover these functions and the user is referred to the GuideTRAX V3 HR manual (P/N 1-1243).

2

Getting Started

This section details how to correctly configure the Saturn “H” system prior to use for the first time.

It is recommended that all users, including users of earlier RINEX systems, read this section to familiarise themselves with the operation of the V3 software and the differences from previous versions.

First time users of RINEX guidance systems are encouraged to read the entire manual to ensure that they are aware of the many features provided on the Saturn “H” system with V3 software.

In particular this section describes the correct way in which to power the system ON and OFF for both the Saturn “H” and “G” systems. It should be noted that there are different between the two models.

2.1 Starting the System

Prior to starting with this manual the guidance system should be completely installed into the vehicle in accordance with the instructions with the installation manual.

2.1.1 Saturn "H"

1) Turn the Isolation Power Switch (IPS) on the Interface Box to the ON position (-). This will not immediately power the system as the vehicle ignition must also be ON. See Figure 2-1 to locate the IPS.

2) With the IPS on the Interface Box in the ON position, start the vehicle and leave the engine running. The Saturn guidance system will start to power on after a short period.

3) Whilst the system is starting the screen will display information pertaining to the onboard computer system. This is the normal starting sequence and can be ignored. Once the system finishes loading the V3 software the Main screen will be displayed and the system is ready for operation.

Figure 2-1 : The Saturn "H" interface box & Isolation Power Switch

In normal operation, leave the Isolation Power Switch (IPS) on the Interface Box in the ON position (-) at all times.

4) To shut the Saturn "H" system OFF turn the vehicle ignition off. This will power down the Saturn "H" system. The IPS should not be switched to the OFF position.

Hints and Tips:

- *There is no Exit button in the V3 software (some earlier versions of GuideTRAX software did have an EXIT button). Do not turn the system off by turning the IPS to the OFF position on the interface box. Shutting down the system off in this way may cause the loss of important system information.*
- *It is possible that the system will start to the Launcher menu and not the GuideTRAX V3 Main Screen if the system was shutdown incorrectly. In this situation select the option to Start GuideTRAX to move to the Main Screen.*

2.1.2 Saturn "G"

1) With the power switch on the interface box in the OFF position start the vehicle.

2) Start the Saturn "G" by turning the power switch to ON position. Note that the system will not start immediately but will commence the startup procedure which takes approximately two minutes to complete. The screen will initially be blank, followed by some text information on the screen. Once the system displays the GuideTRAX V3 Main Screen it is ready for use.

3) To shutdown the Saturn "G" system the power switch should be turned to the OFF position. The system will not power down immediately, but will start the process to power down which takes approximately 30 seconds to finish.

Under normal circumstances the vehicle should not be started with the Saturn "G" system running.

Hints and Tips:

- *There is no Exit button in the V3 software (some earlier versions of GuideTRAX software did have an EXIT button). The system is turned OFF directly at the power switch on the interface box. This is different to the Saturn "H" system.*

2.2 The Main Screen

The system will be ready for operation once the main screen, shown in Figure 2-2 is displayed. This is known as the Main screen and its functionality is described in detail in this manual.

The screen is touch sensitive, which means that the system is operated by touching the buttons on the screen. The user should touch the button on the screen with their finger to select the button.

Under no circumstances should any sharp implement be used to touch the screen or should excessive force be used when touching the screen.

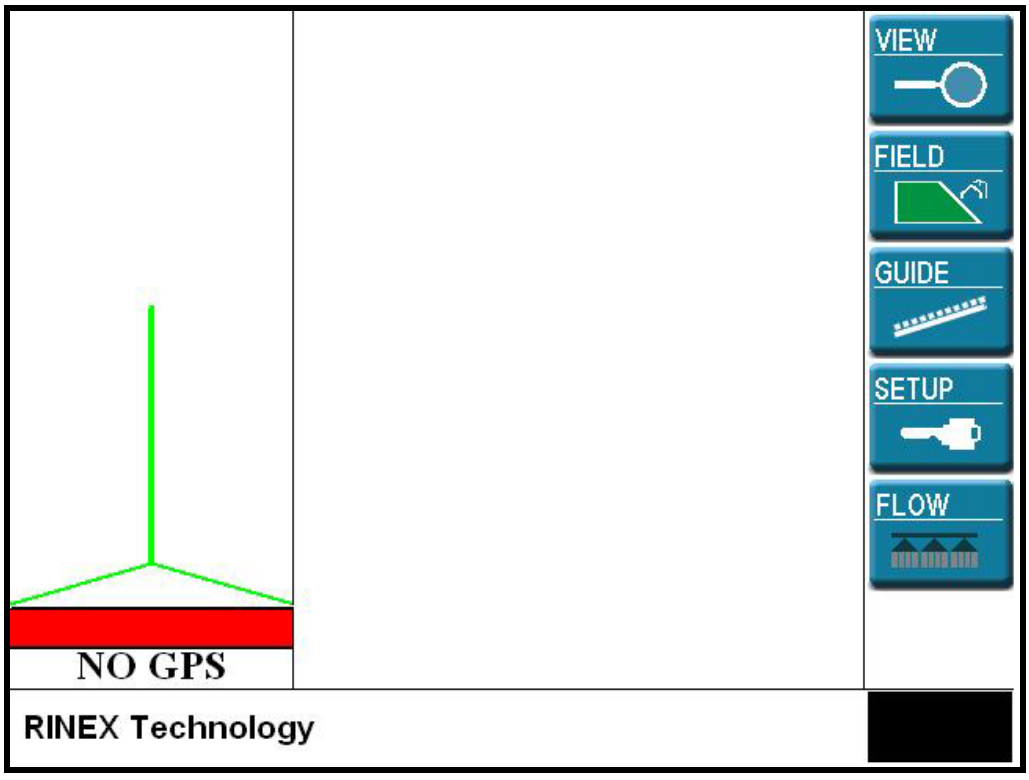


Figure 2-2: The GuideTRAX V3 Main Screen

Hints and Tips:

- *The Main Screen may vary dependant upon the options configured on the system.*

2.3 Registering the System

The Saturn “H” guidance system is configured for specific user requirements via a password. Hence prior to use the system must be configured with the correct code to register the options on the system.

The system has been supplied from RINEX with a password in accordance with the options ordered at time of purchase.

The six character code must be entered in the REGISTER window.

Access: **SETUP** **FARMS** **ADVANCED** **REGISTER**

The password will be supplied with the following information;

- Serial number of the Saturn “H” interface controller unit
- Compact Flash Identification Number (CFID)

If the supplied information does not match the CFID, contact RINEX or their Authorised dealer as the password will not function.

2.4 Setting up the first time

The following list of settings must be set for correct guidance and mapping prior to using GuideTRAX V3. These parameters must be set each time the system is moved between vehicles. Failure to set these parameters correctly may provide incorrect guidance and mapping information.

2.4.1 Set Farms & Fields

Prior to using the HT for the first time it is necessary to setup information pertaining to a Farm, the Fields and the cropping season.

Access: **SETUP** **FARMS** **FARM SETUP**

SEASONS **NEW**

1) A warning message will be displayed stating that all treatments for the current season must be completed. If no unfinished treatments exist in the current season, or this is the first time the system has been used, then touch **OK**.

2) Type in the new season (usually the current calendar year) using the on-screen keyboard and touch **OK** **OK**.

3) Touch **CLIENT** **NEW**

4) Enter the client's name, typically this will be the Trading Name of the Business, then touch **OK**

5) A message requesting a new farm be created will be displayed, then, Touch **OK**

6) The Farm Setup screen will be displayed. Touch **NEW**

7) Enter the Farm name and touch **OK**

8) Use the **UP** and **DOWN** buttons to select the farm name in which the first recorded treatment is required.

9) Touch **OK**

2.4.2 Set Vehicle & Boom

Prior to using the “H” system for the first time it is necessary to setup information pertaining to the vehicle and peripherals including the boom and its sections.

Access: **SETUP** **FARMS** **VEHICLES** **LINKS** **NEW**

1) Type in the new link name (usually the tractor or implement model) using the on-screen keyboard and touch **NEXT**.
2) Enter the length for the front icon measurements then touch **NEXT**.
3) Enter the length for the rear icon measurements then touch **NEXT**.
4) Enter the width for the link icon measurements then touch **NEXT**.
5) Enter the type of link then touch **NEXT**.
6) Enter the length for the GPS Long Track then touch **NEXT**.
7) Enter the length for the GPS Cross Track then touch **NEXT**.
8) Enter the length for the Link Long Track then touch **NEXT**.
9) Enter the length for the Link Cross Track then touch **NEXT**.
10) Repeat steps 1 to 10 for as many tractors or towed implements (links) as necessary.
11) Touch **OK** and then enter the Rigs sub-menu.
12) The Rigs Setup screen will be displayed. Touch **NEW**
13) Touch the “Name =” button and enter the name of the rig then touch **OK**.
14) Touch the **LINK** SETTINGS button, then touch the second number button (total number of links) and using the ↑ ↓ buttons select the total number of links that will be used in the rig, then touch **OK**.
15) Touch the UNKNOWN button, then using the ↑ ↓ buttons select the first link to be used in the rig, then touch **OK**.
16) If necessary touch the first number button to move to the next link in the rig and repeat step 15.

17) Touch **OK**.

18) Touch the **BOOM SETTINGS** button, then touch the No. Sections button (total number of sections) and using the ↑ ↓ buttons select the total number of sections that will be used in the boom, then touch **OK**.

19) Touch the width button for the Boom Section then enter the width of the boom section, then touch **OK**.

20) Touch the Section button to step to the next section and repeat step 19 as necessary until all boom section widths have been entered. The total swath width is displayed in the icon.

21) Touch the **FLOW CONTROL** button, then touch the "Flow Control =" button and using the ↑ ↓ buttons select the MANUAL WITH TOGGLE (this assumes that the RINEX toggle switch will be the Master Switch) to be used for the boom, then touch **OK**.

22) Touch **OK**.

2.4.3 Set the Master Switch

The Master Switch is used to start and stop treatment recording. It is possible to configure a number of devices to be the Master Switch, this section assumes that the RINEX toggle switch is to be used as the Master Switch.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **SWITCH**

1) In the Master Switch Control touch the "Toggle radio button" and then touch the "Touch radio button" in the Section Control, then touch **OK**.

2.5 Connecting the GPS

While GuideTRAX V3 is starting, the attached GPS receiver may need some time before becoming fully operational. If the system is new it is most likely that the GPS has not been powered up since initial factory testing. Hence the GPS Status indicator may show a warning, or an alarm message while the GPS receiver gathers new information about the visible satellites.

While this process is occurring the GPS Status Indicator, located in the lower right hand corner of the main screen and illustrated in Figure 2-3 may show an alarm status (See Section 7.5.1 for more details). When the GPS Status Icon changes to the scrolling satellite, the receiver is ready for normal operation.

Figure 2-3: The GPS Status Indicator with Satellite Icon

2.6 Recording a Treatment

GuideTRAX V3 is designed to record information when the vehicle is operational, such as when a boom spray is actually spraying chemical or a spinner spreader is spreading fertiliser. This manual refers to this operation as a treatment, however it is sometimes also referred to as a coverage area in other publications.

In order to record when a treatment is being applied or when the vehicle is in transit it is necessary to switch between the recording and transiting mode.

The Saturn "H" system can be configured to start and stop recording via three different methods:

- **SCREEN** The screen can be used as the switch by touching either the bonnet on the Virtual Road Window or the Vehicle Icon on the Map Screen. Touching either of these points will then reverse the action.
- **TOGGLE** The RINEX Toggle switch is connected to the "H" interface controller and the switch can be turned ON or OFF. Additionally the RINEX Toggle can be wired to peripheral devices which supply a 12vDC switch when the treatment is ON (eg. a spray rate controller solenoid), see Section 6.6.1 for further details.
- **EXTERNAL** The "H" system is compatible with a number of peripheral controllers which communicate with the interface controller via a computer protocol. It will be necessary to confirm compatible controllers with RINEX.

Once the switch mechanism has been decided upon it is necessary to configure the system to know which switch is being used.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **SWITCH**

3

Vehicles & Booms

The GuideTRAX V3 software incorporates advanced vehicle modelling software to ensure that the recorded treatment areas are truly correct. It is particularly relevant as further advances in GPS accuracy is available and automatic control of treatment application is adopted.

The V3 software can accurately model a spray boom towed behind a tractor or trailed behind a tank which is towed by a tractor. In order to perform these calculations it is imperative that the measurements of the vehicle and GPS antenna are accurately recorded.

The V3 software is designed to allow numerous plant and equipment used on the farm to be entered into the database for selection of a rig that may be used for seeding, spraying or any operation where the guidance system is used.

The convention used in the V3 software is to have a Rig which comprises one, two, or three links. This concept is illustrated in Figure 3-1 which shows three links to assemble one Rig.

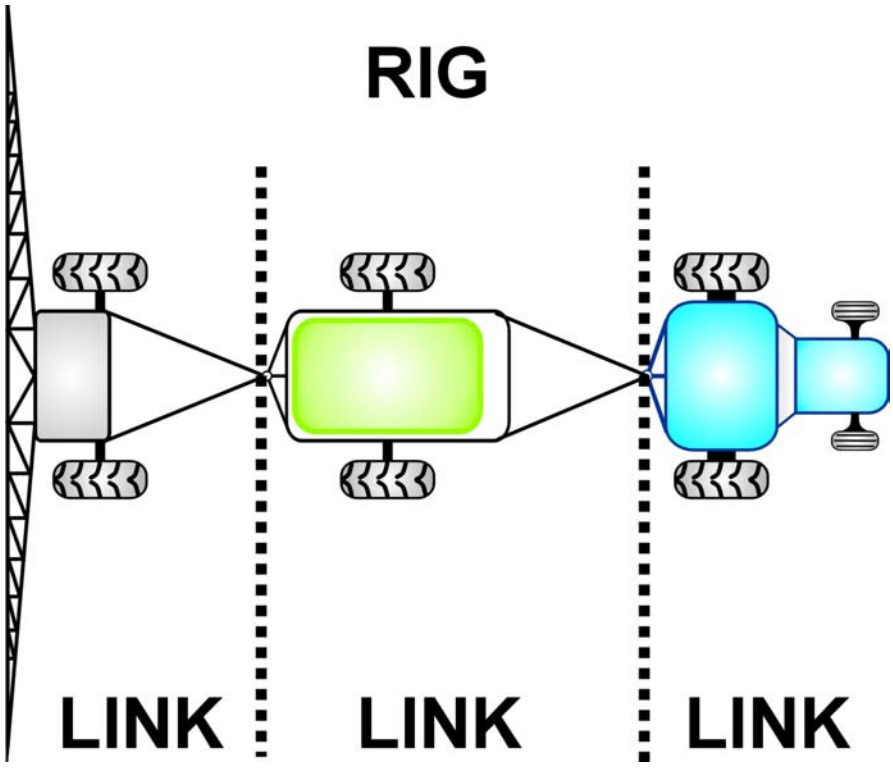


Figure 3-1 Rigs and Links

3.1 Configuring the vehicle

Access: SETUP FARMS VEHICLES LINKS

The first link that will be used in the assembly of a rig will be the vehicle. The vehicle may comprise several different types including, a conventional tractor, truck, an articulated tractor, or a self propelled boom spray.

The different characteristics specific to individual vehicles are described in the following sections.

3.1.1 Tractor

The term vehicle is used generally in this manual to describe the link at the front of a rig. The vehicle may be either a tractor, truck or any other vehicle which is used for towing other plant or for applying treatment.

The measurements for the vehicle are illustrated in Figure 3-2. In essence the measurements from the GPS antenna to the centreline of the axles, vehicle, and the hitch point will need to be recorded and entered into V3.

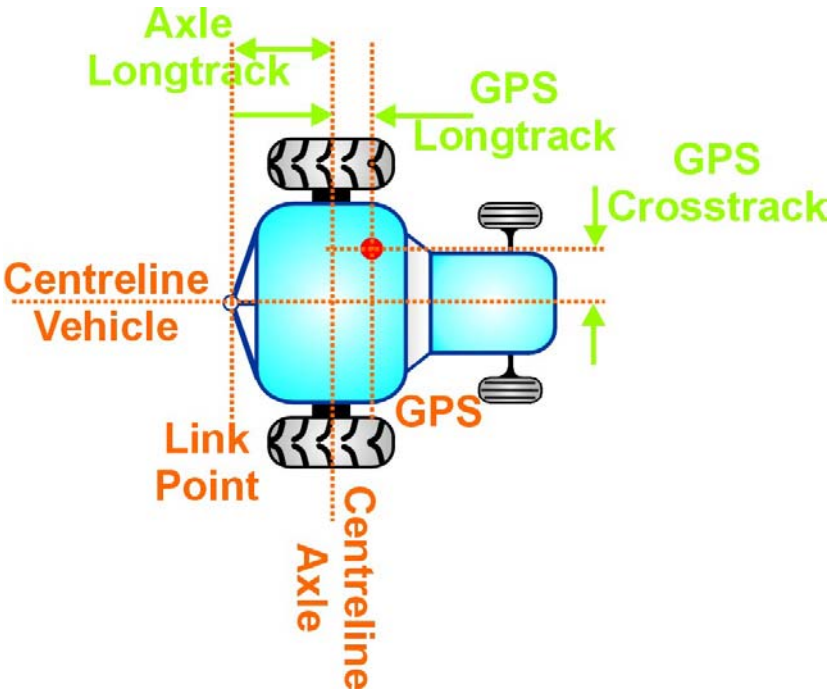


Figure 3-2 Tractor & Measurements

3.1.2 Articulated Tractor

The articulated tractor is a combination of two links as treated in the V3 software. In order to enter the details of an articulated tractor it will be necessary to enter the measurements as indicated in Figure 3-3.

The front half of the tractor, will be entered as the first link in the rig, and the second half will be entered as the second link in the rig. Note that the GPS Longtrack measurement must be entered as a negative value if it is behind the front axle as shown in Figure 3-3.

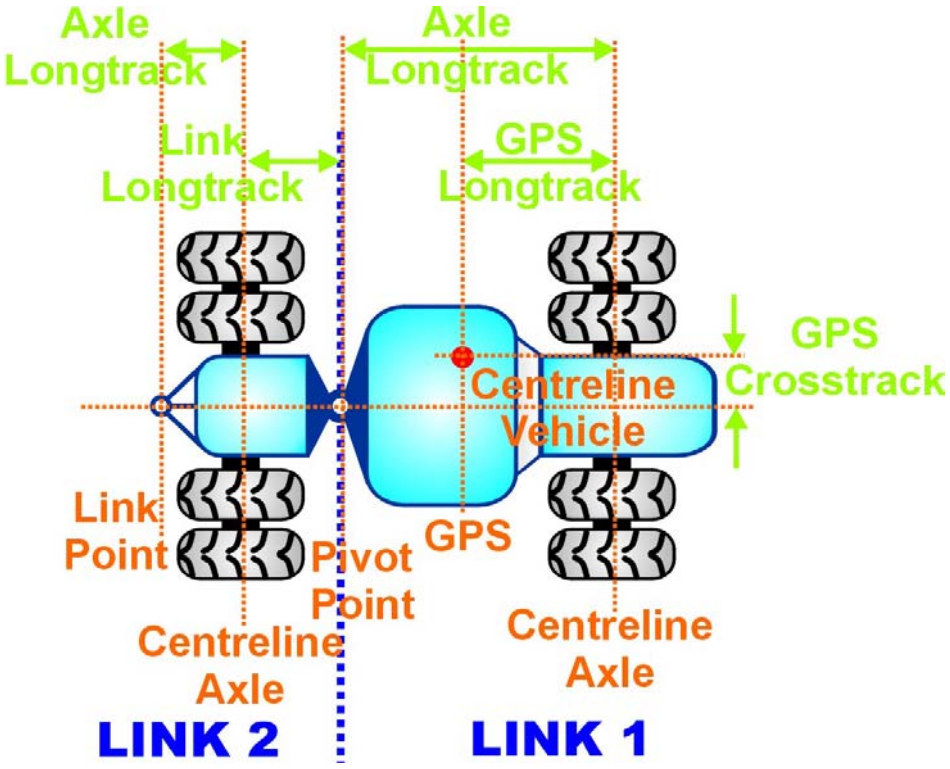


Figure 3-3 Articulated Tractor

3.1.3 Self Propelled Sprayer

The self propelled sprayer is treated in V3 as one link with the boom spray attached at the link or pivot point. In addition to this self propelled sprayers may also have the boom attached to the front of the vehicle. In this situation the Axle Longtrack measurement to the boom will be a negative value. These measurements are illustrated in Figure 3-4.

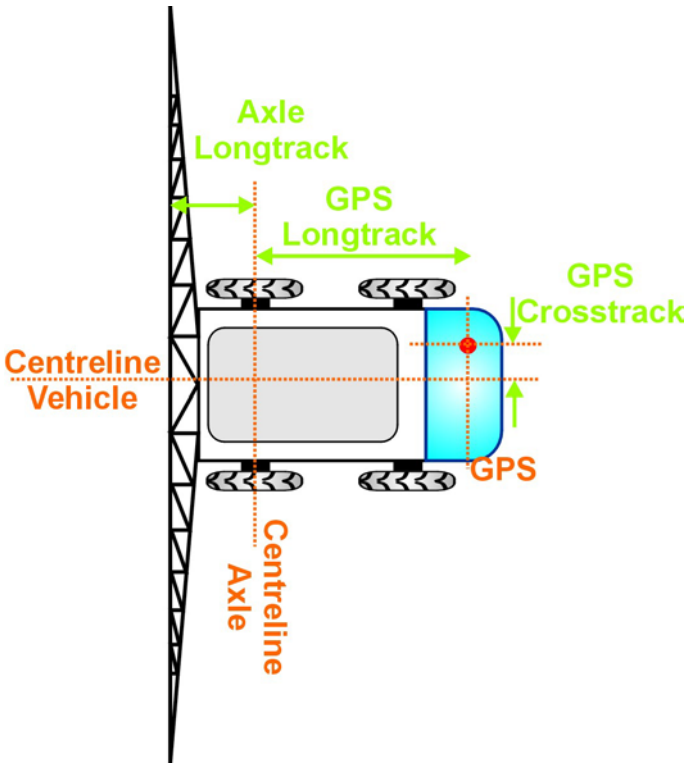


Figure 3-4 Self Propelled Sprayer

3.2 Configuring the towed implement

Access: **SETUP** **FARMS** **VEHICLES** **LINKS**

The second or trailed link in a rig is typically of one or the other varieties. Commonly referred to as a Pig or a Bogey trailer, their characteristics and measurements are detailed below.

3.2.1 Pig Trailer

The Pig or the conventional trailer is very simple to model. The trailer may have one or more axles which are all located at the rear of the trailer. This is illustrated in Figure 3-5.

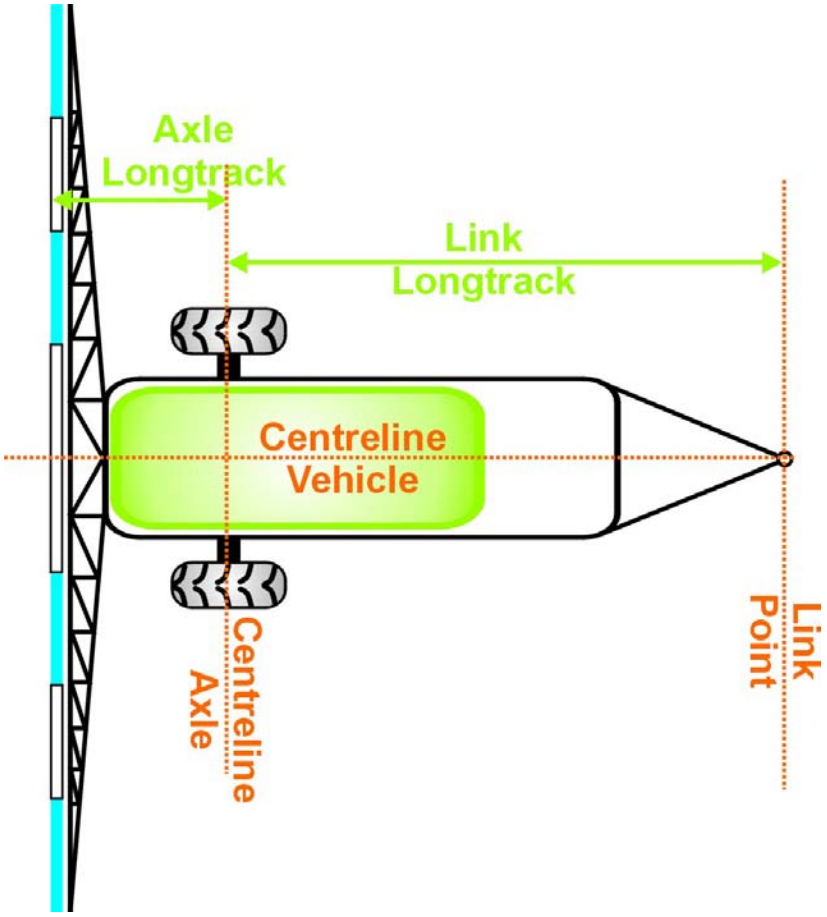


Figure 3-5 Conventional Trailer

3.2.2 Bogey Trailer

The Bogey trailer is similar in concept to the articulated tractor as it comprises of two links. The trailer has at least two axles with the leading axle being mounted on a turntable as illustrated in Figure 3-6.

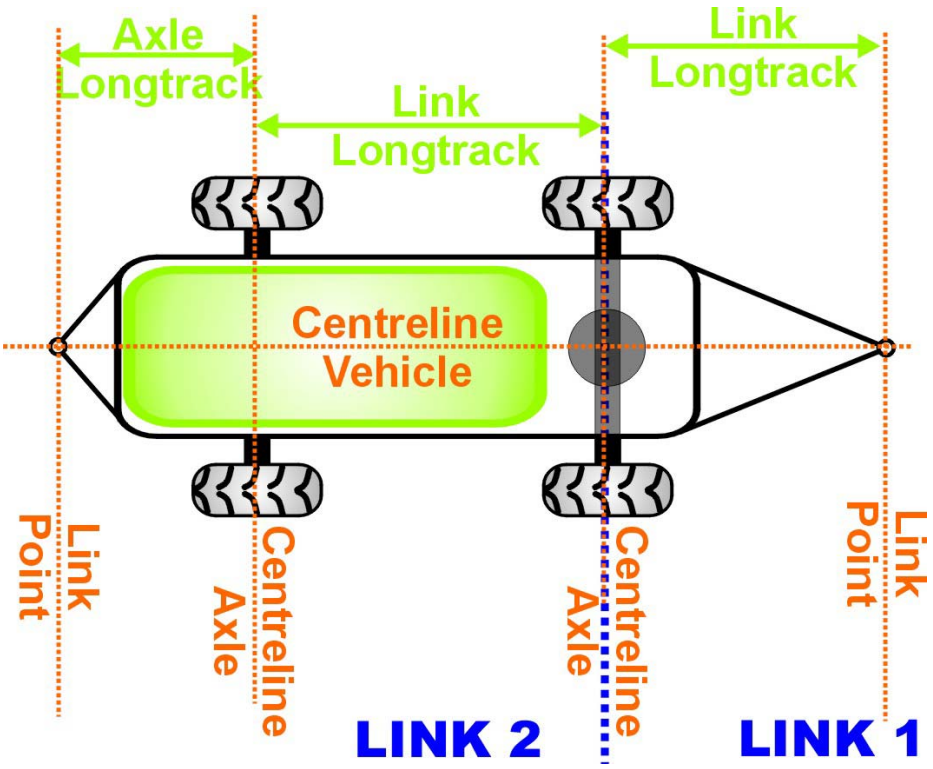


Figure 3-6 Bogey Trailer Layout

When entering information for the two links the front section of the trailer must be entered as the first of the two links that make up the rig. The front section of the trailer will have an Axle longtrack measurement of 0.0 metres.

3.3 Configuring the Rig

Access: SETUP FARMS VEHICLES RIG

The Rig comprises one or more links. The Rig also defines the boom or swath width, the tank capacity, the flow controller and steering controller used in the makeup of the Rig.

3.3.1 Configuring the Boom Settings (Swath Width)

Access: SETUP FARMS VEHICLES RIGS NEW BOOM SETTINGS

The swath width of the rig represents the actual width of the treatment applied. Hence the swath width may represent the width as applied from a spreader, or may apply to the width of a spray boom.

When a spray boom is used the boom settings may be divided into sections to represent the actual boom spray. The boom settings, the number of sections and their respective widths may be configured in the Edit Rig Window.

3.3.2 Configuring the Steer Controller

Access: SETUP FARMS VEHICLES RIGS NEW STEER CONTROL

If the system is fitted with an automated steering controller it must be selected from the list of compatible controllers in order for the system to function correctly. The Steer Controller settings are configured in the Edit Rig Window.

4

Farms & Fields

The GuideTRAX V3 software is primarily designed as guidance system for vehicles operating in fields. However the GuideTRAX V3 software also has the ability to save information relating to treatments in these fields, particularly when the field treatment has not been finished.

The two models, HL and HT, are designed for different user requirements. In essence it is whether treated areas are to be recorded for future purposes, or simply for vehicle guidance.

Both the HL and HT models use Virtual Memory for automatically saving treatment information whilst working in a field.

The HT model extends beyond the Virtual Memory for permanently saving field information. The HT model uses a Farm Field structure which is easily recognised in by the relationship of one farm that may have many fields as shown in Figure 4-1.

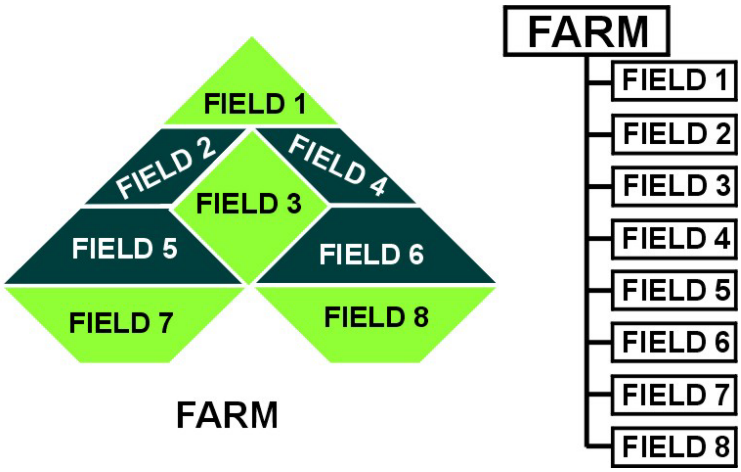


Figure 4-1 Farm & Field Structure

4.1 Virtual Memory

The V3 software automatically saves field information whilst the system is operational. This information is saved in the onboard Virtual Memory. The Virtual Memory will retain the information on the treatment area until such a time that is cleared from the Virtual Memory. Furthermore the information is retained regardless of whether the system has been shutdown or not. Accordingly a field can be left unfinished and completed at a later date by using the Virtual Memory.

Access: **FIELD** **MEMORY**

There are nine virtual memory slots in all versions of the GuideTRAX software, as illustrated in Figure 4-2. As product treatment is recorded, the information is saved in the selected virtual memory slot. It will stay in the selected slot until it is either finished by touching the **FINISH FIELD** button (not available in HL model), or the field is restarted.

All nine virtual memory slots can be occupied by unfinished treatment data at any one time.

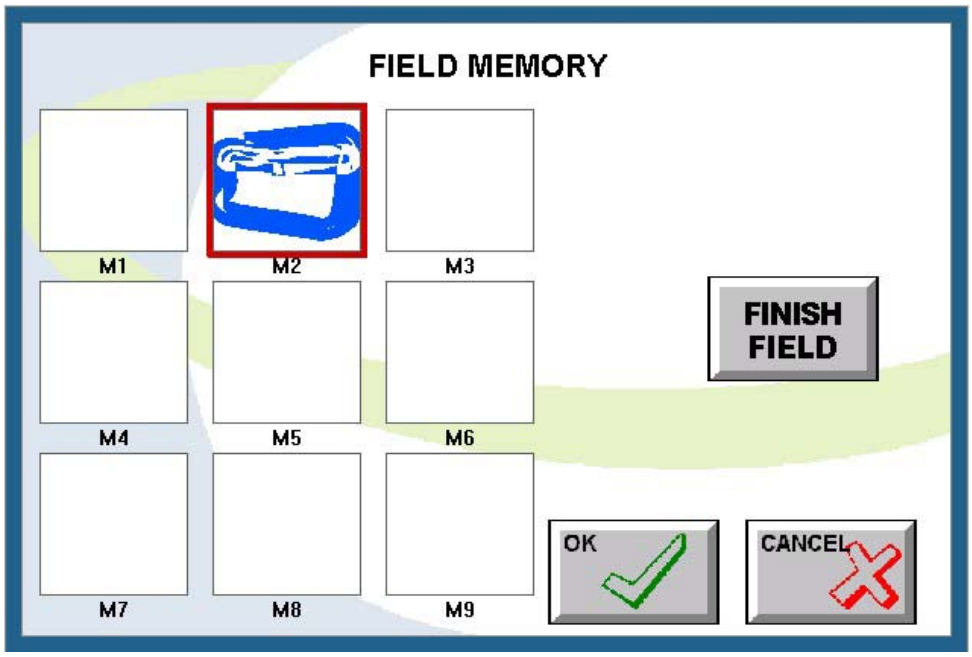


Figure 4-2 Field Memory Window

4.2 Setting Up the Season, Farms and Fields

In order to record information so that it may be easily retrieved in the future it is necessary to have a logical database system. The HT model uses the Farm Field structure which is easily recognised by the relationship of one farm that may have many fields. Furthermore each Farm is defined in a cropping season.

The HT version will allow a user to create one or more farms on the system and each farm may have one or more fields. All information that is recorded may then be saved to a field as required.

Before using guidance it is necessary to set up where the information will be recorded, i.e. into a season and farm. Field names could also be set up at this time, but it is not necessary, as when a particular treatment for a field has been completed, the field name can be entered at that time – see Section 4.4.

Each field will be saved in the current season and currently selected client and farm, so the current client and farm must be set up and selected before starting a treatment in a particular field.

See Section 2.4.1 for instructions on creating the season, client and farms.

Access: **SETUP** **FARMS**

1) Touch **SETUP** **FARMS** **FARM SETUP** **FARM**
2) Use ↑ or ↓ in the FARM SETUP Window to select the farm name in which the new treatment is to occur.
3) Touch **OK** **BACK** **BACK** **BACK**

4.3 Starting a New Field

1) When a new treatment is being started in a field, a virtual memory slot must first be selected – touch **FIELD** **MEMORY**

2) Select any empty virtual memory slot, or, if none are empty, choose one which is no longer required.

3) If the virtual memory slot has a thick red line around it as shown around M2 in Figure 4-3, then it has been selected.

4) Touch **OK** **RESTART** **OK**. This will clear any previous treatment data from the selected virtual memory slot and set the boom width to the current vehicle.

5) Treatment can now be started.

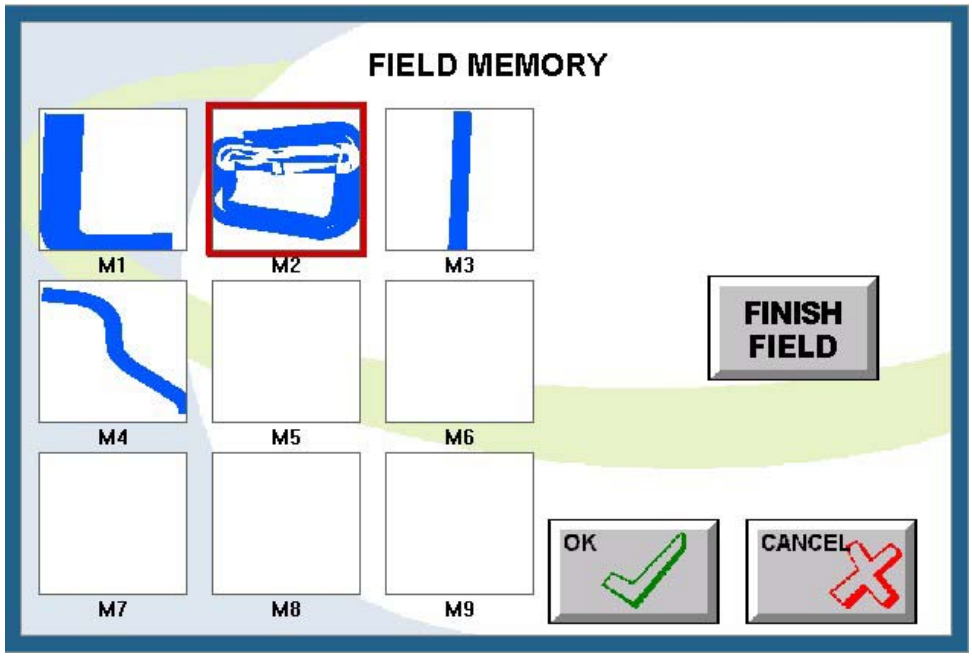


Figure 4-3 Field Memory Window

4.4 Saving a Field

Once a treatment has been completed in a field, the information can be saved to that field's history. The information is then available to be copied and exported from the GuideTRAX system.

1) Turn treatment recording off.
2) Touch **FIELD** **MEMORY**.
3) Select the virtual memory slot containing the finished treatment.
4) Touch the **FINISH FIELD** button.
5) A message will be displayed asking for a name to either be selected from a list or created. Touch **OK**.
6) The SELECT FIELD Window will then be displayed. Either select an existing field name from the list, or create a new field name by touching **NEW**.
7) If a new name is typed in, touch **OK**.
8) On the SELECT FIELD Window, touch **OK** once the correct field name has been selected.
9) A message stating "Treatment successfully finished" will be displayed.
10) Touch **OK** **OK** **BACK**.

4.5 Viewing Field Information

Once the information has saved as described in Section 4.4, it can be viewed in History.

Access: **FIELD** **HISTORY**

1) A list of all fields for the current client and farm will be displayed, as shown in Figure 4-4. If the field has been treated several times in the current season, it may appear in the list several times. The current client and farm are displayed at the bottom of the screen.

2) More details about treatment recorded in the field can be seen by first touching the line of field information to select it, then by touching **EDIT** **PROPERTIES**.

3) Touch on each of the information tabs along the top of the Treatment Properties screen to see more information about the treatment applied to this field. Note that **Driver**, **Weather** and **Notes** information is not available in the HT version.

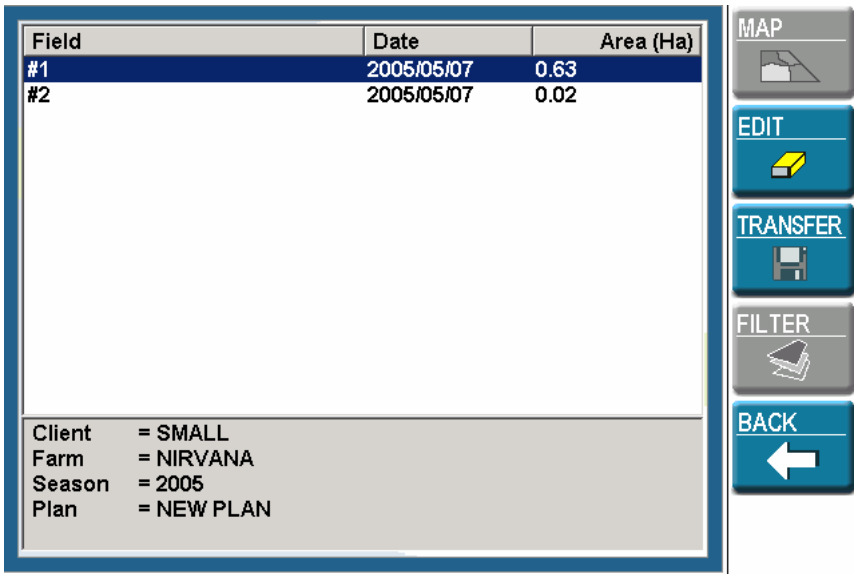


Figure 4-4 Field History Window

4.6 Unfinishing A Finished Field

When a field has been Finished it is removed from the virtual memory and no further treatment information can be added to it. Also, the actual treatment map is no longer available for viewing.

The field can be Unfinished by touching **FIELD** **HISTORY** **EDIT** **PROPERTIES** **Edit** (tab) **UNFINISH FIELD** as shown in Figure 4-5. This will remove it from the History list and return it to the virtual memory, where it will be displayed with the saved field name.

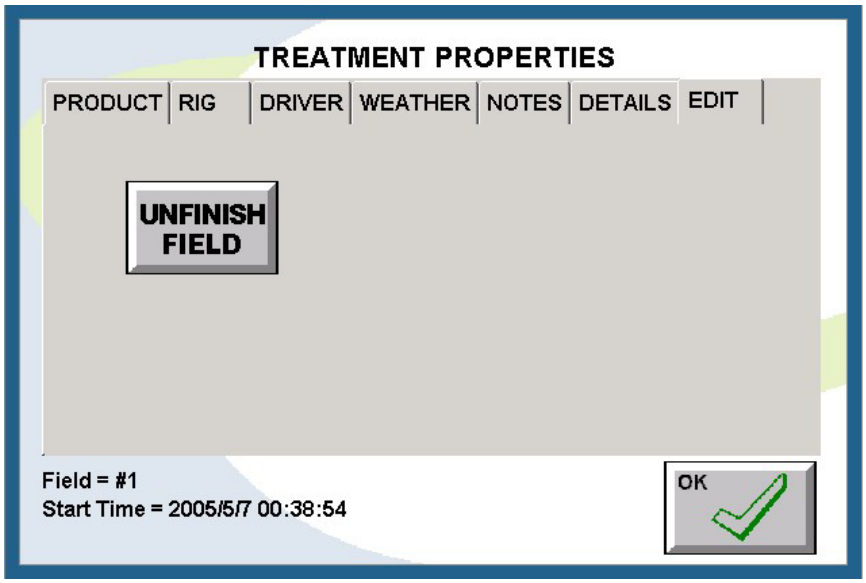


Figure 4-5 Treatment Properties Window

Next time it is finished, a field name will not be requested, instead the field will be moved from the Field Memory to the History List.

4.7 Transferring and Backing Up Saved Fields

Fields which have been saved can be copied to a USB device (USB drive or compact flash card reader + compact flash card):

1) Copy any information on the USB device which needs to be kept to a safe place, as any pre-existing information will be deleted when transferring field data from the Saturn “H” interface unit.

2) Insert the USB drive into the USB port on the Saturn “H” interface unit.

3) Touch **FIELD** **HISTORY** **TRANSFER** **EXPORT** **OK**.

4) A message will appear advising that information already on the USB drive will be deleted if you continue. Touch **OK** to continue transferring data.

5) A progress bar will appear will appear while information is copied, then a message will appear: " Export Completed Successfully". Touch **OK**.

6) The information which has just been copied to the USB drive will still appear in the Transfer list.

7) Touch **BACK** **BACK** **BACK**.

5

Using Guidance

A major feature of GuideTRAX V3 is the ability to provide guidance to the vehicle operator so that treatment can be applied to a field as accurately as possible. In order to treat an entire field the operator will want to ensure that no areas are missed and minimise over lapping areas. Due to the never-ending shapes of fields a number of different spraying techniques have been developed.

These techniques, as shown in Figure 5-1 are summarised as follows.

- **Parallel lines** Perfectly straight lines that are parallel to each other.
- **Racetrack** Lines that are in an ever decreasing shape. The pattern is not necessarily a square or circle.
- **Contour lines** Lines that are parallel, however they are not straight. These lines are typically found around contour banks.

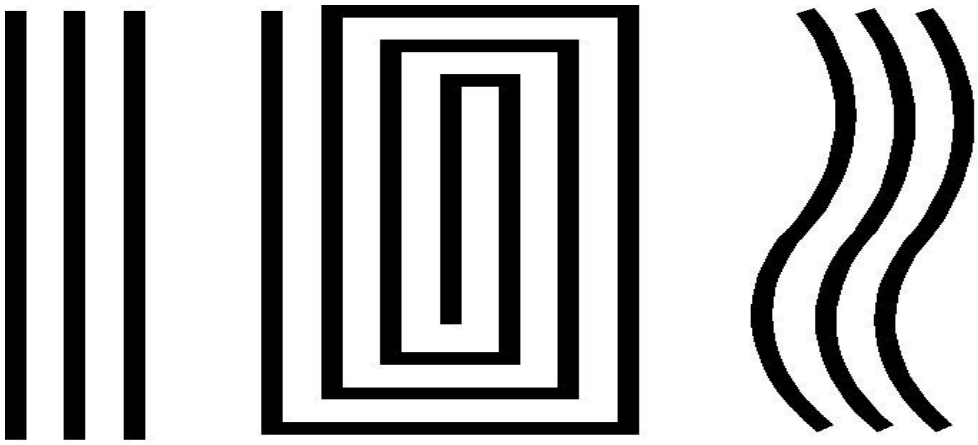


Figure 5-1: Typical patterns used in treating fields Parallel Lines, Racetrack and Contour lines.

It is not the intention of GuideTRAX V3 to decide which method is superior as each operator has their own preferences as to which method they use for a given field. More importantly, it should be noted that the operator could use any of these techniques, or a combination, for guidance in applying a treatment to a field.

5.1 Creating a Guideline

A basic principle of GPS guidance is to create a guideline for the system and operator to follow. The guideline maybe straight or curved depending upon user requirements. Once created the guideline is represented on the map screen as a red line.

In order to create a guideline there are two basic principles to consider. Firstly for straight parallel lines it is necessary to define two points and the guideline is created between these points as shown in Figure 5-2.

Figure 5-2: Guideline with Points A and B

Alternatively a guideline can be created to follow alongside an existing treated area which maybe curved or straight. The guideline is created one swath width away from the existing treatment. This is shown in Figure 5-3.

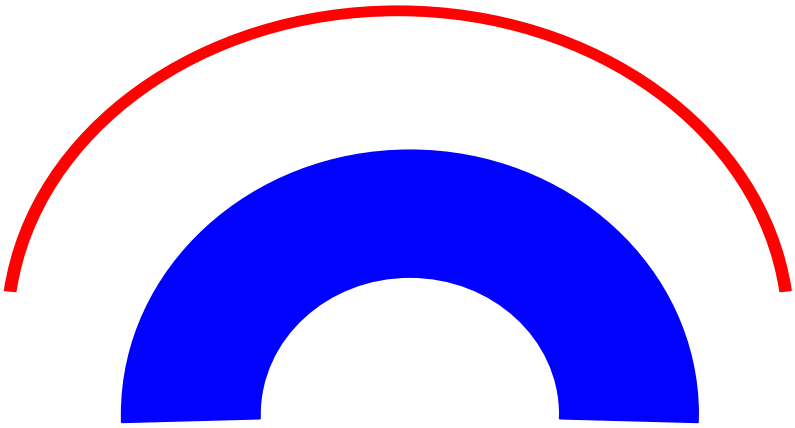


Figure 5-3: Guideline along Curved Treatment

5.1.1 Parallel Guidance

Treating a field using the parallel method is very simple. As previously described, the parallel method is for straight lines only and consequently the first task is to set out a straight line to work from. This is easily achieved by defining one point at one end of the field and one at the other end and connecting the two points with a line. This is termed either the base or key line. From this line, the next parallel guideline is calculated to be across one swath width minus any guide overlap distance entered, see Section 5.3.1. GuideTRAX V3 automatically calculates these parallel guidelines as the vehicle moves around the field. A typical parallel spray pattern is shown in Figure 5-4.

Figure 5-4: A typical spray pattern using parallel guidance. Points "A" and "B" define the base line for all other parallel lines.

The points "A" and "B" should be as far apart as practical to minimise errors in determining the base line. Ideally, the points should be located prior to commencing spraying so that the actual spray pattern along the base line is truly straight. Once the base line is defined, the operator simply needs to follow the indicators on the light bar to stay on-line.

As one swath line is finished and the spray boom is turned off to turn back to start the next pass GuideTRAX V3 will automatically increment to the next parallel line. Swath lines can be sprayed in any order and GuideTRAX V3 will show the nearest parallel line to the vehicle. Swath lines will not be missed, as the treated area on the map screen will always show exactly which areas have been treated and the areas that haven't.

In order to use parallel line guidance, press the **POINT A** button on the Guide Menu. A dot will appear on the screen representing point A. The **POINT A** button will now turn into the **POINT B** button. Once pressed it will create the second dot on the screen.

The **POINT B** button will now turn into the **PARALLEL** Button.

Press the **PARALLEL** button to draw the projected parallel line and activate parallel guidance. The Parallel guidance can be deleted/deactivated on this line by touching the **GUIDE OFF** button or press **POINT A** to redefine a new line (The system will prompt whether to create a new point A or cancel).

Insert New Picture

Figure 5-5: Parallel guidance

5.1.2 Racetrack (Lock) Guidance

The racetrack guidance method is called lock guidance because instead of using a pre-defined line, the system “locks” on to a previous swath when calculating the guideline for the next run.

This method of guidance is also very simple. The operator merely has to drive around the perimeter of the field as usual. Typically the outside perimeter would be governed by a fence line that dictates the shape of the field, this may be rectangular or some irregular shape. This is not important to GuideTRAX V3, as the next swath line will be adjacent to the last swath by the distance of one swath width minus any guide overlap distance, see Section 5.3.1. Once again, this is not important as GuideTRAX V3 automatically calculates this for the operator. A typical racetrack spray pattern is shown in Figure 5-6.

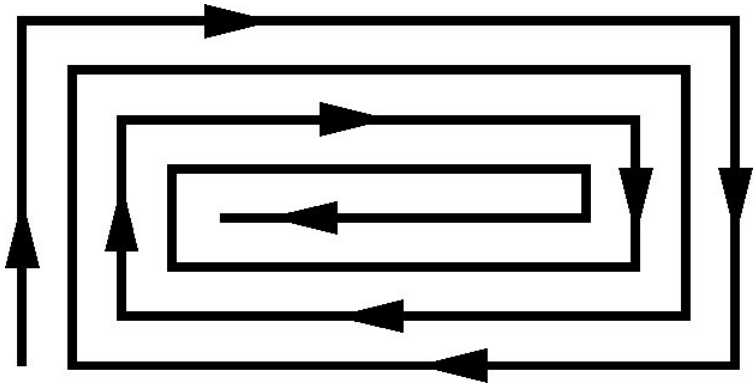


Figure 5-6: Typical Spray Pattern using Racetrack

Once the perimeter of the field is completed the vehicle moves towards the next swath line using the Map screen for guidance. When the vehicle comes alongside the previous treatment (perimeter lap) the operator touches the **LOCK** button in the Guide Menu and then follows the Virtual Road or arrows on the light bar to stay on-line. A guideline is displayed on the Map screen which indicates the line that needs to be followed. GuideTRAX V3 will continue to automatically update the guideline as the vehicle moves around the field.

The guideline will always be computed to be adjacent to the previous treatment. Hence, if the vehicle manoeuvres around a tree the subsequent guideline will also show a deviation. The operator can choose to ignore this guideline and simply steer straight through these areas. A typical racetrack screen is shown in Figure 5-7.

Insert New Picture

Figure 5-7: Typical guideline from racetrack guide lock

5.1.3 Contour Lines Method

A contour line is a set of parallel lines that are not straight; however the adjacent lines are parallel to each other. The contour lines method is the same in operation as the racetrack method for spraying a field. The guidance **LOCK** button is used to lock on to an adjacent line, which is the contour line to be followed.

The operator merely has to drive the first contour line in a field as usual. Typically, this will be alongside a contour bank that dictates the pattern or shape of the contour line to be followed. Similar to before, GuideTRAX V3 computes the next guideline to be adjacent to the last swath by the distance of one swath width minus any guide overlap distance, see Section 5.3.1. Once again, this is not important as GuideTRAX V3 automatically calculates this for the operator. A typical contour spray pattern is shown in Figure 5-8.

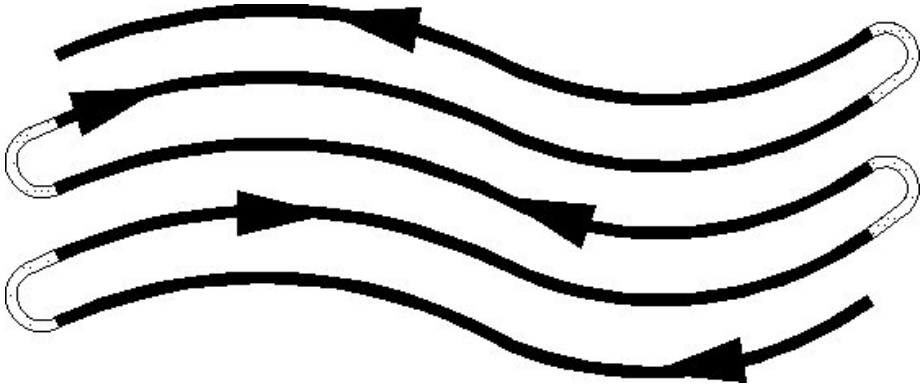


Figure 5-8: Typical Spray Pattern using Contour Lines

As the first contour swath line is completed, the vehicle turns around to commence the next swath line using the Map screen for guidance. Once the vehicle comes alongside the previous swath line (first contour line) the operator engages the guidance lock by pressing the **LOCK** button in the Guide Menu and then follows the indicators on the light bar to stay on-line. A guideline is displayed on the Map screen indicating the lock line that needs to be followed.

At the end of the contour line, guidance is switched off as the vehicle moves away from the treatment. Then as the vehicle is turned around to commence the next contour swath line the guidance lock is once again engaged by pressing the **LOCK** button. This pattern is repeated until the field treatment has been completed.

As with the racetrack guidance, the guideline will always be computed to be adjacent to the last swath line. As shown previously if the vehicle manoeuvres around a tree or some other feature the next guideline will show the same pattern.

Hints and Tips:

- *Turn guidance off before leaving the paddock to save erroneous guidance data being displayed.*

5.2 Guidance information

Guidance information is provided to the operator using the Map screen, the Virtual Road Window and optionally using the external light bar. Each device presents information to the operator that enables them to make decisions on which direction to travel.

The Map screen provides a bird's eye (Map) view of the treated area. The map view clearly shows where the vehicle is and the direction it is heading. It may be configured as the North Up display or the Heads Up display. Most operators prefer the Map Screen to be orientated in the Heads Up mode as the top of the screen represents the direction the vehicle is heading. Furthermore the treated swath shows which areas have been treated and the area yet to be treated.

Alternatively, the display can be split to show both the Map screen and the Virtual Road window. The Virtual Road displays an image directly forward of the vehicle, from a typical vehicle operator position, to show the guideline.

In addition to this the directly below the Virtual Road Window is the lightbar which defines the offset to the guideline. The lightbar information is computed from the centreline of the vehicle to the guideline and the ligthbar arrows may be configured for user preference. Each arrow can be configured to represent one centimetre or one metre. This same information will also be displayed on the external lightbar (optional item).

In summarising there is no right or wrong method to adopt, it is quite simply a user preference as to which information is used for guidance.

5.2.1 Virtual Road Information

The Virtual Road is very easy to follow as the information displayed is very intuitive. The Virtual Road can be likened to driving along a roadway, however rather than driving on one side of the road, the whole road was used and the white line painted down the centre represented the guideline.

When sitting in a vehicle and looking forward along the road it appears to become smaller as it approaches the horizon. Similarly the Virtual Road becomes smaller as it approaches the top of the screen. Deviations

along the road are also easily interpreted as the Virtual Road has no obstructions to block the view along the roadway.

An important aspect to consider is the width of the roadway in the Virtual Road. This does not represent the actual swath width of the treated area, but rather a fat guideline. The actual guideline in the centre of the roadway is the true position where the vehicle should be driven.

The Virtual Road has a vehicle bonnet in the lower portion of the Window with an elongated line extending from the centre of the bonnet as shown in Figure 5-9. This represents the centreline of the vehicle projected forward along the Virtual Road. The tip of the triangular bonnet represents the centre of the vehicle.

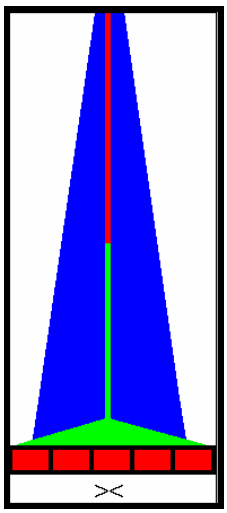


Figure 5-9: The Virtual Road

In essence the red guideline and the green centreline of the vehicle should coincide for perfect guidance.

The width and depth of the Virtual Road may be customised for individual user preferences if necessary, see Section 6.4.4 for further details.

5.2.2 Lightbar

The lightbar information is configured to display how far off-line the vehicle is from the guideline. The accuracy required for the lightbar information will be dependant upon two factors, firstly the input GPS information and secondly the required treatment.

The information that is displayed to below the Virtual Road Window may also be displayed on the optional external lightbar. The external lightbar provides the driver with guidance information from a physical device that is mounted in the driver's line of vision. Changes of direction are easily seen, without having to look away from the driving task at hand.

There is little need to have the light bar showing an accuracy to a level of centimetres if the treatment is being applied by a broadcast spinner spreader with an accuracy of one to two metres.

The lightbar provides a left-right indicator showing which way the operator must steer to get on to the current guideline. The operator manoeuvres the vehicle to either the left or right as indicated by the lightbar until the vehicle is on-line. A typical light bar display is shown in Figure 5-10.

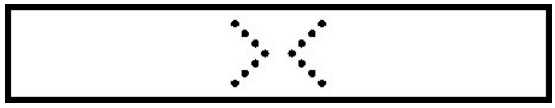


Figure 5-10: The lightbar display showing the vehicle is on-line.

If the vehicle veers off-line, the lightbar will display arrows indicating the direction (left or right) needed to steer to the current guideline. The number of arrows shows how far off-track the vehicle is, determined by preset distances (See section 6.3.5 for details on how to define the lightbar offsets). If the vehicle travels further away than these distances, the display will show how many metres/feet the vehicle is away from the guideline.

Figure 5-11: The lightbar display showing the vehicle is between 2-3m to the left of the guideline. (Note: Distance depends on lightbar settings)

Figure 5-12: The lightbar display showing the vehicle is 5m off-line.

5.3 Guidelines and offsets

The V3 software allows the user to adjust the position of the guideline to suit different requirements. Typically this will be either to suit the requirements of the accuracy of the GPS receiver and/or the ability for the operator to follow a guideline. Furthermore it may be to assist in adopting tramline farming where different width implements are used, and when an automated steering system (AutoSTEER) is used.

5.3.1 Guide Overlap

Prior to using GPS guidance most operators automatically applied a natural overlap to accommodate any inaccuracies whilst driving. This overlap may have varied according to prevailing circumstances such as whether their foam markers were visible or not.

GPS guidance however does not have a natural overlap from the operator's mind but rather a mathematical offset that is either applied or not.

The Guide Overlap is simply the amount of overlap that is applied to allow natural overlap to ensure that no area is missed when applying a treatment if the vehicle is driven wide of the guideline.

This is shown in Figure 5-13.

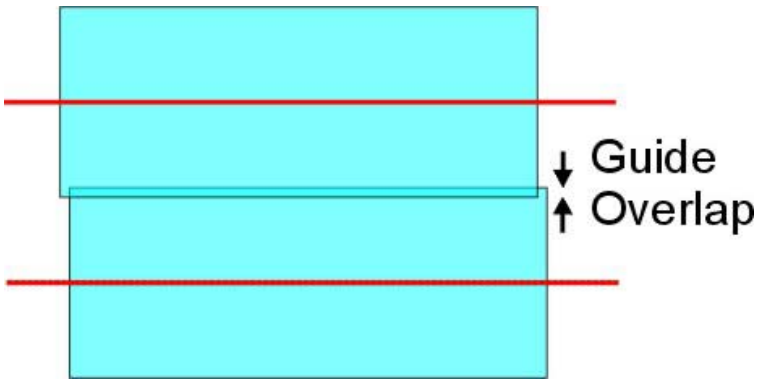


Figure 5-13 Guidance Overlap

5.3.2 Adjust GPS

The accuracy of GPS will always drift in time and consequently it may be necessary to apply small adjustments to the position of the vehicle relative to a previously established guideline. This is commonly referred to as “Nudging” or “Adjusting” the GPS guideline.

The V3 software incorporates the GPS Adjust, as shown in Figure 5-14. This allows the system to be automatically or manually adjusted to the current vehicle position.

In order to use the automatic adjustment the vehicle should be driven on the previous guideline so that it is exactly on the guideline. The parallel guidance should be operational and the offset on the lightbar should be noted.

Once this has been completed using the ADJUST button will automatically adjust the guideline to the current vehicle position. The offset will be set to zero.

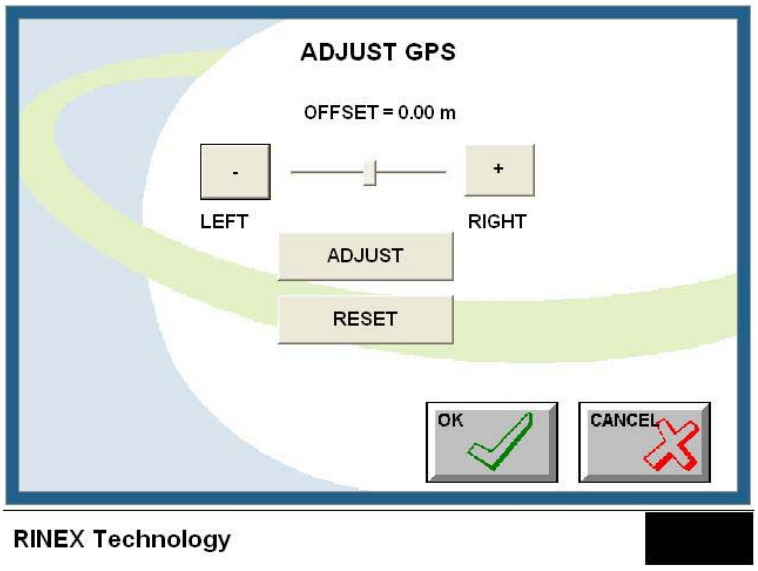


Figure 5-14: The Guideline Offset Window

5.3.3 Guide Offset

When using tramlines in controlled traffic farming practices it will be desirable to use the same guidelines for all farming activities. However the implements will be of different widths and consequently it will be necessary to use an offset.

The Guide Setup, as shown in Figure 5-15 allows for an implement offset to be entered.

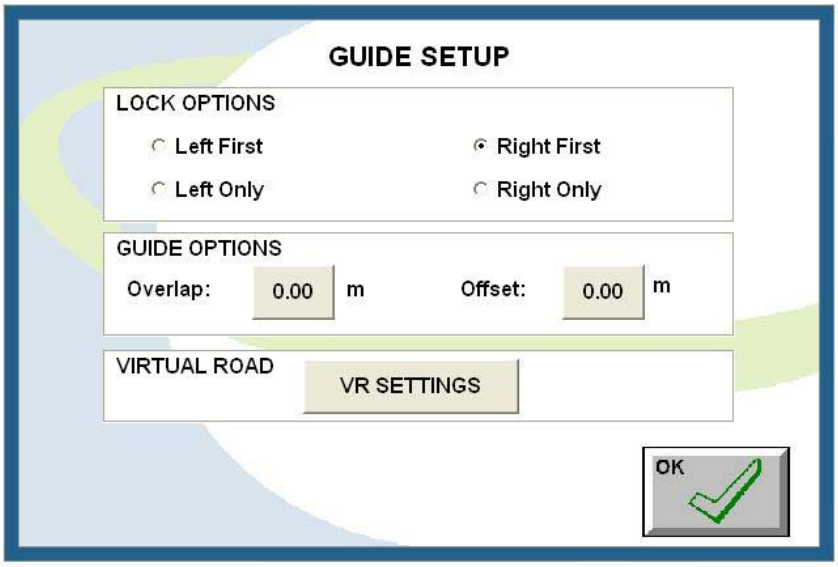


Figure 5-15 Guide Setup Window

Once the offset has been entered it will be necessary to restart the field.

6

Customising the System

6.1 Enabling Options

Some options are standard with all versions of the GuideTRAX software, but need to be turned on/selected in order for these options to work.

Other options can be purchased, in which case they then need to be enabled by requesting a password from Rinex Technology.

6.1.1 Standard Options

Access: SETUP OPTIONS

The following standard options are available in all versions of the GuideTRAX software:

- **Sounds**

  If Sounds have been selected and speakers are connected to the audio plug on the Saturn H interface unit then audible alarms will sound in the following circumstances:

  - If AutoSTEER is enabled, an alarm will sound when AutoSTEER changes state as follows:
    - Becomes Ready
    - Becomes Not Ready
    - An Error state occurs
  - In the HR version, an alarm will sound if the vehicle drives into a field which is not included in the loaded treatment plan. See HR User Manual for more information.

- **AutoLock**

  With AutoLOCK set ON and Lock guidance activated, GuideTRAX will automatically search for lock at regular, short intervals and continue drawing a guideline.

  If AutoLock is not selected, and GuideTRAX loses lock (i.e., stops drawing a guideline) then the Lock button in the Guide menu must be touched in order to generate the guideline again.

The following options are "extras" which can be purchased from Rinex Technology:

- **Mapping**

  Mapping is only available in the HR version – see HR User Manual for more details.

- **AutoSPRAY**

  AutoSPRAY is only available in the HT and HR versions. Refer to the AutoSPRAY User Manual for more information about AutoSPRAY.

- **AutoSTEER**

  AutoSTEER is only available in the HT and HR versions. Refer to the AutoSTEER User Manual for more information about AutoSTEER.

6.1.2 Enabling Options By Password

Access: **SETUP** **FARMS** **ADVANCED** **REGISTER**

Following purchase, they must first be enabled by requesting a password from Rinex Technology.

Figure 6-1 Register Window

1) The CFID number displayed on the screen, as shown in Figure 6-1 will need to be quoted when requesting the password from Rinex Technology.

2) Touch the **Password** button to enter the password, and then touch **OK**.

3) Touch **OK** **OK** **BACK** **BACK** to return to the **Setup** menu.

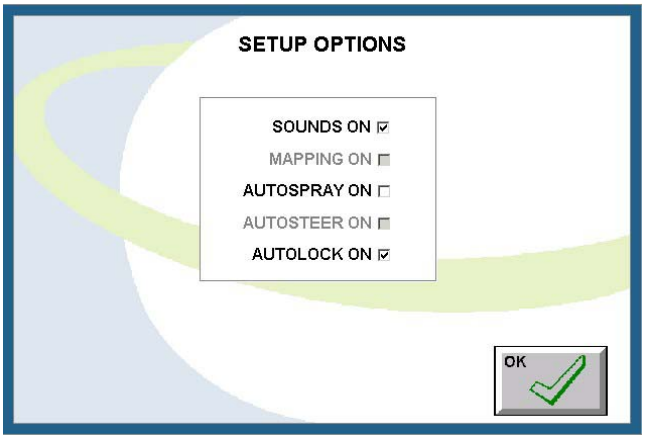


Figure 6-2 Setup Options Window

4) Touch **OPTIONS**. Once an option has been password enabled it will appear in black type on the Setup Options Window as shown in Figure 6-2.

5) Text for options which have not been password enabled will be grey.

6.1.3 Selecting and Enabling Options

Access: **SETUP** **OPTIONS**

To select or to turn an option ON, touch either the checkbox or the name of the option. This will place a tick in the checkbox of the option.

Touch **OK** **BACK** to return to the top menu.

6.2 GPS Configurations

6.2.1 Defaults

The default settings are:

GPS BAUD:	19200
POSITION UNITS:	Lat/Long
GPS Type:	DGPS

6.2.2 Changing the GPS Baud Rate (Speed) Setting

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **GPS**

The GPS baud rate will be set by default to 19200 baud. This rate can be changed if required to a lower baud rate as follows:

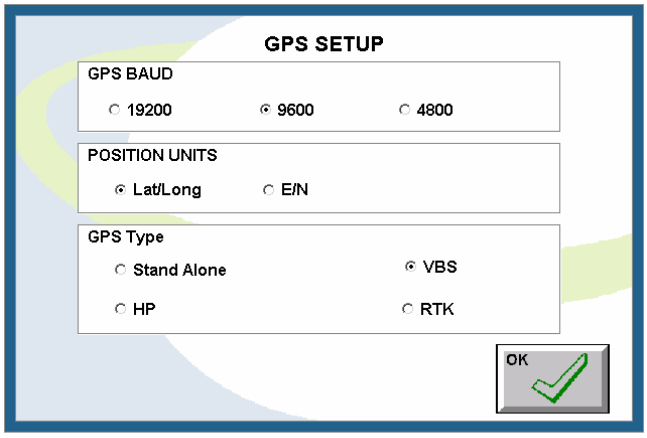


Figure 6-3 GPS Setup Window

Touch on the appropriate speed to put a dot next to it as shown in Figure 6-3.

Touch **OK**.

6.2.3 Setting GPS Accuracy

By default, the system is configured to run on Differential GPS (DGPS). It is recommended that DGPS be used as a minimum.

This setting needs to be changed if using OmniStar-HP (High Performance) or RTK for AutoSTEER.

DGPS

Select DGPS for:

- Standard OmniStar DGPS
- Marine beacon
- e-Dif

OmniStar-HP

Select HP for the OmniStar High Performance DGPS signal

RTK

Select RTK if you are using RTK for AutoSTEER.

GPS Only

Select GPS Only if a higher accuracy signal cannot be acquired. Note that this setting is not recommended as it is not as accurate as higher accuracy signals and therefore significant errors can be introduced into the system when calculating guidance.

When GPS Only is selected, the scrolling GPS Status Indicator in the bottom right corner of the screen will only display the No Differential signal symbol:

Touch **OK** **BACK** **BACK** **BACK** to return to the Main menu.

The system must then be restarted via the ignition switch before the new settings will take effect.

6.3 Guidance Information

6.3.1 Heads Up/North Up

There are two modes of displaying information while it is being recorded (while driving). Choosing one or the other of these two views can affect the guideline being drawn on the screen.

Touch **VIEW** to select Heads Up or North Up mode.

Touch the **HEADS UP / NORTH UP** button to change to either Heads Up or North Up mode.

Heads Up – as the vehicle moves along the ground, the information on the screen is drawn so that the vehicle is always pointing towards the top of the screen, with the ground moving around the vehicle. The Heads Up button

is displayed.

North Up – as the vehicle moves along the ground, it also moves around the screen but the ground is shown as staying stationery. The North Up

button is displayed.

6.3.2 Finding the Vehicle or Treated Area

Touch **VIEW** to access the **IN**, **OUT** and **ALL** buttons.

If the Map screen is zoomed too far in or out, it may be difficult to see areas which have already been treated. Touch **VIEW** **ALL** to see the treated area, then **IN** to see the vehicle and **OUT** to see the vehicle position in relation to the treated area.

If the vehicle is a long way from the treated areas in the currently selected field, either the vehicle or the treated areas may not be visible on the screen.

If the treated area is visible but not the vehicle, zoom **IN** to see the vehicle.

If the vehicle is visible on the screen but not the treated area, touch **VIEW** **ALL** to see the whole treated area, then zoom **IN** to see more detail of the area around the vehicle.

If zoomed too far out, the vehicle will appear as a large dot on the screen. As you zoom in, the vehicle will increase in size on the screen until it resembles the selected rig.

6.3.3 Zooming In and Out While Driving

While the vehicle is moving, GuideTRAX will not allow the system to zoom too far Out or View All in Heads Up view, but will allow permit the system to zoom In as close as possible.

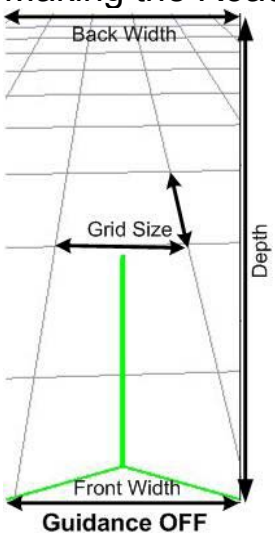
In North Up view, it is possible to View All and zoom In or Out as far as required while driving.

6.3.4 Virtual Road

Access: **SETUP** **FARMS** **ADVANCED** **GUIDE** **VR SETTINGS**

The Virtual Road can be customised for width and depth of view, however, the default values, as shown in Figure 6-4 are the recommended values.

Making the Virtual Road too short (depth) can result in corners coming up too quickly to be able to turn in time. Making the Back Width too narrow can create a distorted appearance which is difficult to drive to. Making the Road Width too narrow can also make it difficult to drive to.



Default Values

Front Width	10m
Back Width	60m
Depth	100m
Road Width	5m
Grid Size	10m

The grid provides an easy way of measuring Virtual Road dimensions.

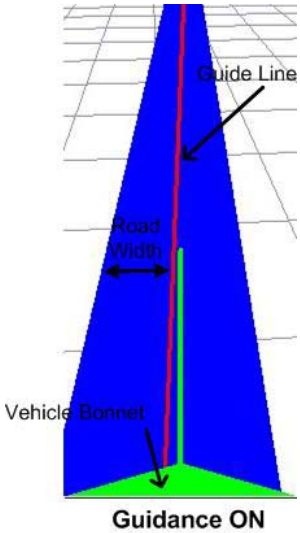


Figure 6-4 The Virtual Road Display

6.3.5 Lightbar

Access: SETUP FARMS ADVANCED CONNECT LIGHTBAR LIGHTBAR SETTINGS

The lightbar settings can be customised for higher or lower accuracy depending on the accuracy of the GPS receiver.

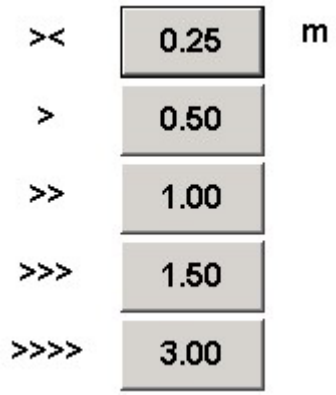
Each setting represents how far away (in metres) the vehicle is from the guideline. In the default settings shown below, the **><** symbol set to 0.25m means that the lightbar will display **><** to indicate that the guideline is being followed to an accuracy of up to 250mm.

It is recommended that the lightbar limits are set in relation to GPS accuracy.

The default lightbar settings shown here are set for a default GPS type of DGPS (Differentially corrected GPS).

For a higher accuracy GPS receiver, it may be more appropriate to set the single arrow **>** to 0.01m, with other settings set similarly.

For e-Dif, less accuracy would be more appropriate and for GPS Only, settings should be set to even lower accuracy.



6.4 The Screen

Access: SETUP DISPLAY SCREEN

6.4.1 Grid

By default the grid is OFF and the Grid Spacing is set to 100 metres. The grid is light-grey pattern on the background of the Map Screen. When turned ON, it enables the driver to quickly assess a distance or area in a particular place on the screen. For example, the area encompassed by a grid square measuring 100m x 100m = 1 Ha.

Touch the SPACING button to change the Grid spacing figure.

6.4.2 Display Units

The units which are displayed on the screen throughout GuideTRAX can be set to either Metric or Imperial, and can be changed from one to the other and back again at any time.

By default, the Display Units are set to Metric.

6.4.3 Night Mode

Night Mode was designed to assist night time driving.

When selected, Night Mode turns the background from white to black. Writing which was black is then displayed white, and Guide Points (A & B) are displayed grey.

Night Mode can be turned ON or OFF at any time.

6.4.4 Virtual Road

As discussed in Section 6.3.4, the Virtual Road can be turned ON or OFF here. When turned OFF, the Virtual Road window will not be displayed at all, and the Map Screen will expand to fill the Virtual Road Window.

6.5 The Status Bar

Access: **SETUP** **DISPLAY** **SCREEN**

STATUS BAR

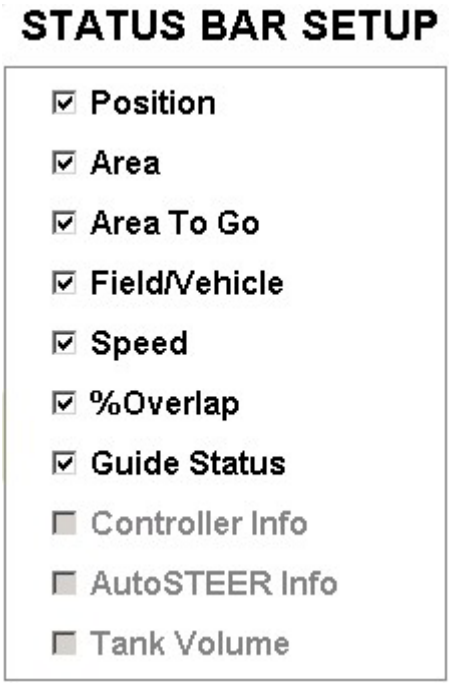
The Status Bar is the left half of the area at the bottom of the main screen. Repeatedly touching this area will cycle through each of the Status messages selected in the Status Bar Setup window. The default is that all Status Bar information display is OFF.

To turn a status message on so that it will appear in the Status Bar, touch the checkbox or text next to the required message in the Status Bar Setup window.

The status messages shown on the right in black text are available in all versions of GuideTRAX V3.

Messages which appear in grey text are unavailable. When the Options or GuideTRAX V3 versions they relate to (AutoSTEER and HR) are enabled these options will become available for selection.

For more information about the information provided in each message, see Section 7.4.



6.6 Turning Treatment Recording ON and OFF

6.6.1 The RINEX Toggle Switch

The RINEX Toggle Switch is supplied with every new system. It can be used to start and stop treatment recording – either on its own or by being connected to a controller (in which case the controller's master switch starts and stops treatment recording).

Using the RINEX Toggle Switch Alone

When used without being connected to a third party controller, the RINEX Toggle Switch is plugged into the Controller port on the front of the Saturn H interface unit. Switching the RINEX Toggle Switch on or off will turn treatment recording ON or OFF.

Connecting the RINEX Toggle Switch to a Third Party Controller

When connected to a third party controller, the RINEX Toggle Switch must be permanently left in the OFF position (if the RINEX Toggle Switch is left on, then treatment recording can't be turned off) and the third party controller's master switch must be used to turn both treatment and recording on and off together.

1) Follow the instructions in the Saturn H Guidance System Installation Manual for installation of the RINEX Toggle Switch, connecting it to the Controller port on the Saturn “H” interface unit.

2) The RINEX Toggle Switch functionality must be registered within the GuideTRAX software. Follow steps 1 to 4 in Section 6.1.2. Enabling Options By Password for obtaining a registration password.

3) Touch **FARMS** **VEHICLES** **RIGS**.

4) Select the vehicle in which the RINEX Toggle Switch has been installed, as shown in Figure 6-5.

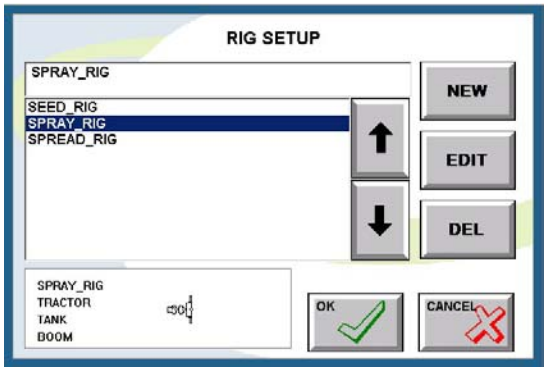


Figure 6-5 Rig Setup Window

5) Touch **EDIT**.

6) In the Edit Rig window, touch **FLOW CONTROL**.

7) Touch the **FLOW CTRL** button as shown in Figure 6-6.

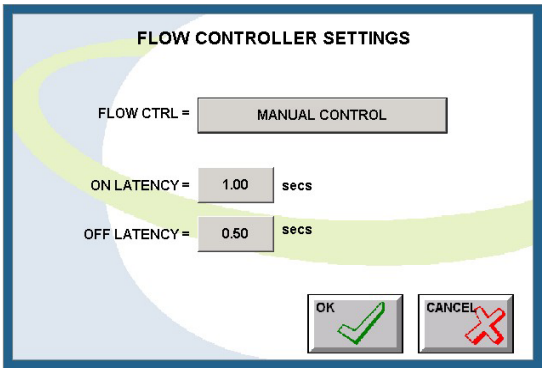


Figure 6-6 Flow Control Settings Window

8) Select Toggle from the Flow Controller list.

9) Touch **OK** **OK** **OK** **BACK** **ADVANCED** **CONNECT** **SWITCH**.

10) Select Toggle in Master Switch Control and Touch in Section Control as shown in Figure 6-7.

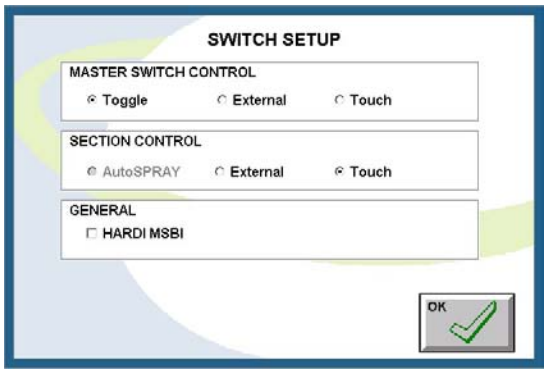


Figure 6-7 Switch Setup Window

11) Touch **OK** **BACK** **BACK** **BACK** **BACK** to return to the Main menu.

6.6.2 Using Touch Instead Of a Switch

Treatment recording can also be started and stopped by touching the Vehicle Position Marker on the Map screen or by touching the green bonnet triangle in the Virtual Road Window.

In this case, the Master Switch Control will need to be set to Touch.

6.6.3 Connecting Directly to a Third Party Controller

Treatment recording can also be started and stopped with compatible controllers that connect directly to the Saturn “H” system. It will be necessary to ensure that the correct data interface cable is used.

1) Follow the instructions in the Saturn H Guidance System Installation Manual for connecting to a Third party controller to the Controller port on the Saturn “H” interface unit.
2) Touch **FARMS** **VEHICLES** **RIGS**.
3) Select the vehicle in which the RINEX Toggle Switch has been installed.
4) Touch **EDIT**.
5) In the Edit Rig window, touch **FLOW CONTROL**.
6) Touch the **FLOW CTRL** button.
7) Select the desired Third Party Controller from the Flow Controller list.
8) Touch **OK** **OK** **OK** **BACK** **ADVANCED** **CONNECT** **SWITCH**.
9) Select External in the Master Switch Control of the SWITCH SETUP Window.
10) Select External in the Section Control of the SWITCH SETUP Window.

6.7 The RINEX Button Box (Optional Extra)

The RINEX Button Box connects to one of the two USB ports on the Saturn “H” interface unit and has four buttons which can each be set to perform various GuideTRAX functions.

Access: **SETUP** **DISPLAY** **BUTTONS**

The default settings for each button are shown in Figure 6-8.

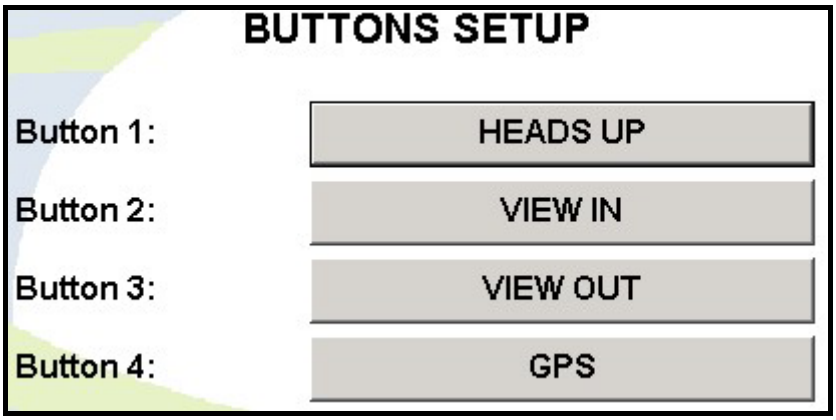


Figure 6-8 Buttons Setup Window

These settings can be changed for each button by touching on the value assigned to that button. All of the options listed in Table 6-1 are available to all buttons, and using each option has the same effect as going through the menus to select the function or turn the setting ON or OFF.

The RINEX Button Box and the RINEX Footswitch can both be connected at the same time, so that five buttons are then available.

6.8 The RINEX Foot Switch (Optional Extra)

The RINEX Foot Switch is designed to be operated by foot and is connected to one of the USB ports on the Saturn “H” interface unit.

By default, the Foot Switch is set to Rove/Record, but can be changed to perform any of the functions listed in Table 6-1.

The RINEX Button Box and the RINEX Footswitch can both be connected at the same time, so that five buttons are then available.

Table 6-1: Button Box and Foot Switch Settings

Function	Function Location	Action Performed By Button
AutoLOCK ON/OFF	**SETUP** **OPTIONS**	Toggles between AutoLOCK being active and inactive. See Section 6.1.1 Standard Options for more information.
AutoSPRAY ON/OFF	**SETUP** **OPTIONS**	Toggles between AutoSPRAY being active and inactive (i.e., controlling spraying).
AutoSTEER Status	**AutoSTEER** Status bottom of the screen (if enabled)	Turns AutoSTEER ON or OFF.
Day/Night	**SETUP** **DISPLAY** **SCREEN** **NIGHTMODE**	Toggles between black (Night) or white (Day) background.
GPS	**GPS** Status bottom right corner of screen	Brings up the GPS Status window.
Guide Left/Right	**SETUP** **FARMS** **ADVANCED** **GUIDE**	Cycles through the four lock-guidance options: Left First, Right First, Left Only and Right Only.
Intensity	**SETUP** **DISPLAY** **INTENSITY**	Brings up the Lightbar (optional) Intensity window.
Lock Guide	**GUIDE** **LOCK**	Enables Lock guidance.

Table 6-1: Button Box and Foot Switch Settings		
Function	**Function Location**	**Action Performed By Button**
Parallel Guide	**GUIDE** **PARALLEL**	Enables Parallel guidance (after AB points have been set).
Rove/Record	Vehicle Icon on Map Screen OR Green bonnet in Virtual Road Window.	If Touch has been selected in Setup > Farms > Advanced > Connect > Switch, then pressing a button which has been set to Rove/Record is the same as touching the screen to turn treatment recording on and off.
View All	**VIEW** **VIEW ALL**	Zooms display to show all of the recorded treatment data in the current field.
View In	**VIEW** **VIEW IN**	Zooms display in.
View Out	**VIEW** **VIEW OUT**	Zooms display out.
Virtual Road	**SETUP** **DISPLAY** **SCREEN** **VIRTUAL ROAD ON**	Turns the Virtual Road window on or off.

6.9 The Multi Section Boom Interface
(Optional Extra)

An optional feature of the GuideTRAX software is the ability to display all active boom sections on the screen using the Multi Section Boom Interface (MSBI) as the individual are switched ON and OFF. This enables optimal coverage of a field, minimising the overlap.

The MSBI is connected between the controller port on the Saturn "H" interface unit and the spray controller. It detects the status of each boom section (ON or OFF) and passes this information to GuideTRAX where it is recorded and mapped on the screen.

The red section indicators under the Virtual Road window reflect the information about each boom section (ON or OFF) as it is received from the MSBI.

6.9.1 Installation

Follow the instructions supplied with the Multi Section Boom Interface, and connect the interface cable between the MSBI and the controller port on the Saturn "H" interface unit.

6.9.2 Registering and Enabling the MSBI

1) The Multiple Boom Section Interface functionality must be registered within the GuideTRAX software. Follow steps 1 to 4 in Section 6.1.2 for obtaining a registration password.

2) Touch **FARMS** **VEHICLES** **RIGS**.

3) Select the vehicle in which the MSBI has been installed as shown in Figure 6-9.

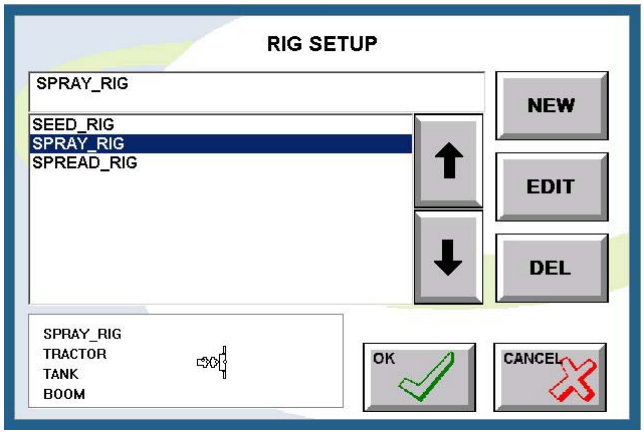


Figure 6-9 Rig Setup Window

4) Touch **EDIT**.

5) In the Edit Rig window, touch **FLOW CONTROL**.

6) Touch the **FLOW CTRL** button.

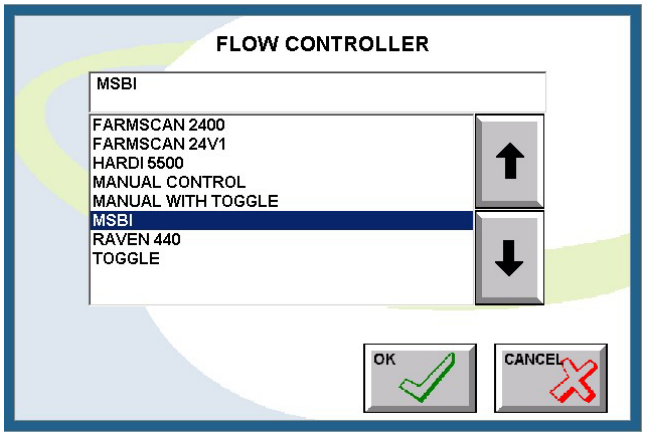


Figure 6-10 Flow Controller List Window

7) Select MSBI from the Flow Controller list as shown in Figure 6-10.

8) Touch **OK** **OK**.

9) Touch **BOOM SETTINGS**.

10) Check that the boom settings are correct and make any required changes.

11) Touch **OK** **OK** **OK** **BACK** **ADVANCED** **CONNECT** **SWITCH**.

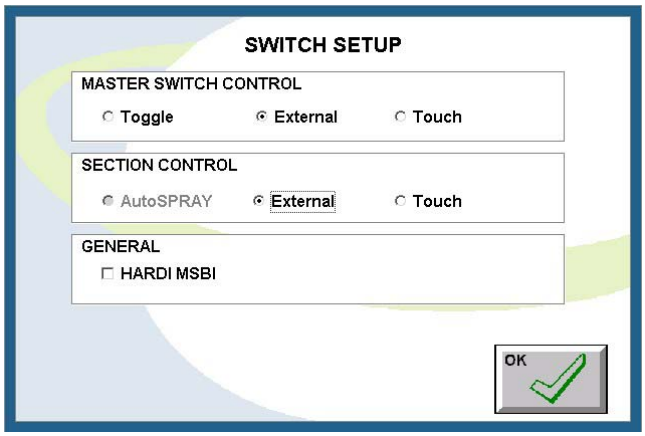


Figure 6-11 Switch Setup Window

12) Select External in both Master Switch Control and Section Control. If the MSBI is connected to a Hardi Co-Pilot, then select Hardi MSBI as shown in Figure 6-11.

13) Touch **OK** **BACK** **BACK** **BACK** **BACK** to return to the Main menu.

The current field must be restarted before the new settings will take effect.

7

The Displayed Screens

The GuideTRAX V3 operates on colour touch screen. Hence to access any function on the system it is a simple case of touching or tapping the screen on the appropriate button.

The RINEX screen is a 22cm (diagonal measurement), or an optional 27cm, which should be securely attached to the vehicle in accordance with the installation manual.

This section describes the various parts of the screen that both displays and allows the user to enter information into the system. Understanding the terminology of the various parts of the screen is important as the manual refers to these sections when describing the functions of the guidance system.

7.1 The Main Screen

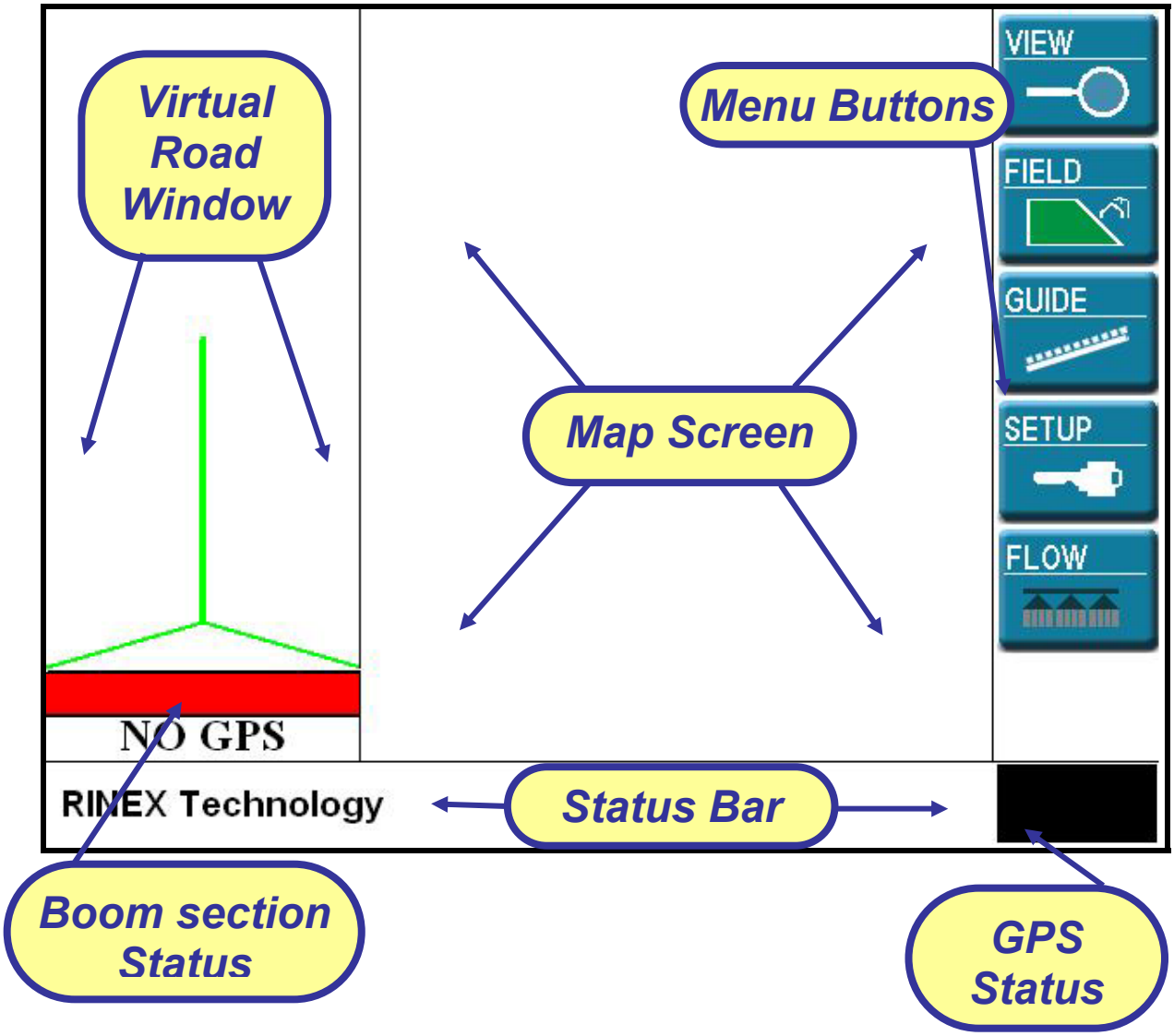


Figure 7-1: The Main Screen

Overview: The main screen displays the following information.

Item	Description
Map Screen	The Map Screen occupies the greater part of the overall screen and displays the treated area as a map view.
Virtual Road Window	The Virtual Road Window on the left hand side of the screen can be toggled ON or OFF. If guidance is not activated the display will not display a Virtual Road.
Status Bar	The Status Bar is located at the bottom of the main screen. It can be toggled to display status information relating to the field and system.
GPS Status	The GPS Status Indicator is used to display the current GPS status. A visual alarm will be displayed if the GPS does not conform with the setup parameters.
Menu Buttons	The Menu Buttons are displayed on the right hand side of the screen. The buttons will change as sub-menus are selected for operation.
Boom Section Status	The Boom Section Status displays the ON / OFF status of one or more boom sections dependant upon the configuration of the system.

7.2 Map Screen

INSERT NEW PICTURE

Figure 7-2: A typical Map Screen

Overview: The map screen displays the following components:

Item	Description
Vehicle Icon	The Vehicle Icon represents the position of the rig in relationship to the treated areas. The Vehicle Icon will show all links that make up the current rig.
Guideline	A guideline will be displayed when either Lock or parallel guidance is activated. The guideline is represented by a solid red line on the Map Screen that is used to guide the vehicle around the field.
Treated Area	When treatment is on, the treated area is recorded. This is then displayed on the Map Screen and is represented as the blue shaded area on the screen.
Grid	When the grid is on, grid lines will be displayed on the Map Screen. The grid lines run in a north-south, east-west direction.

7.3 Virtual Road Window

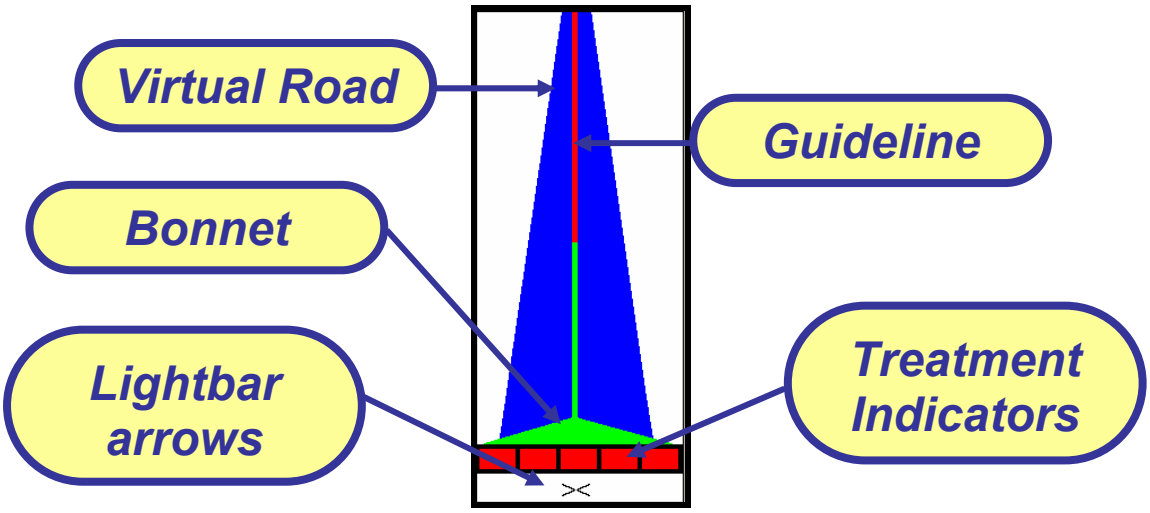


Figure 7-3: A typical Virtual Road Window

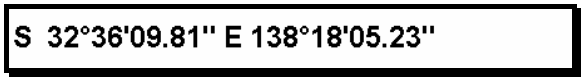
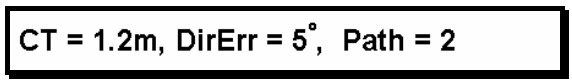
Overview: The Virtual Road Window is designed to represent a road from the position of driver looking across the bonnet to the guideline.

Item	Description
Virtual Road	The Virtual Road is represented by the Blue roadway in the Window. The Virtual Road does not represent the actual swath width of the boom, but rather the central portion of the swath.
Guideline	The guideline is represented by the Red line in the centre of the Blue Virtual Road.
Vehicle Bonnet	The Green triangle in the Virtual Road Window represents the front bonnet of a vehicle. The elongated line from the bonnet shows the vehicle alignment in relationship to the guideline. When the triangle is filled solid Green it indicates that treatment recording is ON.
Treatment Indicators	The treatment indicator displays the number and current status of sections on a boom. A box filled Red indicates that the section is ON, a blank box (White) indicates the section is OFF.

Item	Description
Lightbar Arrows	The lightbar arrows are displayed below the treatment indicators once guidance has been activated. The lightbar arrows indicate the distance from the vehicle to the guideline.
Grid	A grid will be displayed in the Virtual Road Window if selected in the setup.

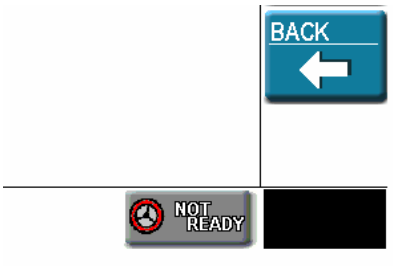
7.4 Status Bar

Overview: The Status Bar is displays system status information:

Item	Description
Position	 This displays the current position of the vehicle.
Area	This displays the current treated area. When one lap of the paddock has been completed, the total encompassed area will also be shown.
Area To Go	This displays the total area minus the treated area.
Field / Vehicle	This displays the number of the selected field and the implement swath width.
Speed	This displays the current vehicle speed.
% Overlap	This display option is available when AutoSPRAY is on. It displays the percentage of overlapped area in the current field.
Guide Status	 This display option is available when AutoSTEER is ON. It displays the distance from the current guideline, the angle the vehicle is travelling to the guideline and the current guideline number.

Item	Description
Controller Info	CT = 1.2m, DirErr = 5°, Path = 2 This displays indicates information from a Third Party Controller.

7.4.1 AutoSTEER Button



Overview: The AutoSTEER Button is displayed on the Status Bar when the option is enabled. The AutoSTEER button displays and controls the status of AutoSTEER.

7.5 GPS Status Indicator

Overview: The GPS Status Indicator displays the current status of the GPS or alarms. The indicator also selects the GPS Info window for additional GPS information. The states of the GPS Status Indicator is listed in the table below:

Icon	Description
	The satellite symbol scrolling through the icon indicates good GPS.
	The **DØ** alarm indicates good GPS, however the GPS is not corrected in any way (GPS only).
	The **ØG** alarm indicates poor GPS.
	The **DØG** alarm indicates no GPS.
	A totally blank GPS Status indicates that no data is being received at the GPS port.
	The View Mode indicates that GPS data is not used. The system will be in View Mode when the Field Menu is accessed.

7.5.1 GPS Status Window

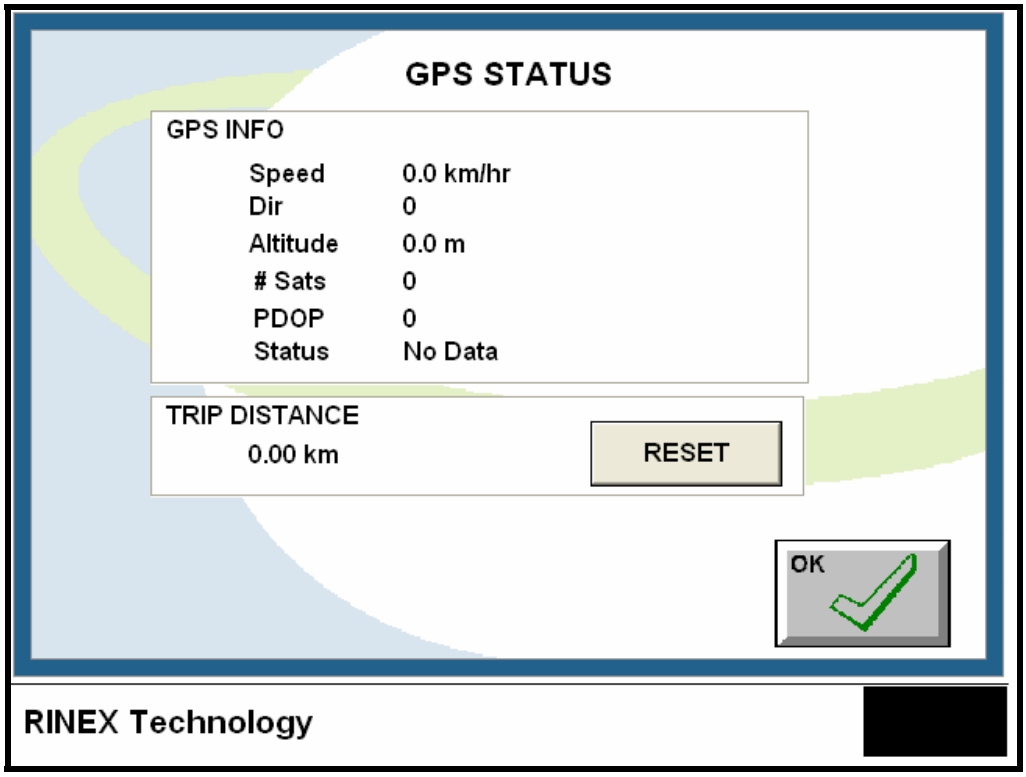


Figure 7-4: The GPS Info Window

Overview: The GPS STATUS window displays information related to the GPS. It display information computed from the GPS, and an odometer.

Name	Function
GPS INFO	The GPS information displayed is detailed as; • Speed: The current vehicle speed. • Dir: The current vehicle direction displayed as an azimuth (angle relative to North). • PDOP: The PDOP (Position Dilution of Precision) is a measure of the positioning quality. The PDOP value should be less than 4 for accurate positioning. • Altitude: The altitude of the vehicle above sea level. • # Sats: The number of GPS satellites observed. • Status: Displays the current GPS status, also indicated by the GPS Status Icon.
Trip Distance	The trip distance is an odometer as recorded by GPS. It records only when the master switch is ON.
Reset	The Reset button resets the trip distance back to 0.00Km.
OK	The OK button closes the GPS Status window.

8

The Launcher

The Launcher is a utility that is pre-installed onto the Saturn “H” systems. It is used to perform various functions such as resetting the system, upgrading software and accessing the Windows shell.

8.1 Opening the Launcher

In normal operation, the Launcher program will not be seen. The system will automatically start the GuideTRAX software when the system is activated.

However when it is necessary to open the Launcher program to perform any of the Launcher functions, the following steps must be taken.

8.1.1 Saturn "H" series

1) Turn the vehicle ignition OFF.
2) Power down the Saturn "H" interface box by turning the IPS on the interface box to the OFF (0) position.
3) Start the vehicle ignition.
4) After the vehicle has started, power up the Saturn "H" system interface box by turning the IPS on the interface box to the ON (-) position.
5) The Saturn "H" system will now start up displaying the Launcher program. Accessing the Launcher functions is detailed in the following sections.
6) The system will revert to the normal starting procedure after it is shutdown.

8.1.2 Saturn "G" series

1) Power down the Saturn "G" interface box by turning the power switch on the interface box to the OFF position.
2) Turn the vehicle ignition OFF.
3) Connect a keyboard to the Saturn "G" interface box.
4) Start the vehicle ignition.
5) After the vehicle has started, hold down the "Shift ⇧" key whilst powering up the Saturn "G" system interface box by turning the power switch on the interface box to the ON position.

6) The Saturn “G” system will now start up displaying the Launcher program. The “Shift ⇧” key can now be released, the Launcher functions can be accessed as detailed in the following sections.

7) The system will revert to the normal starting procedure after it is shutdown.

8.2 Using the Launcher

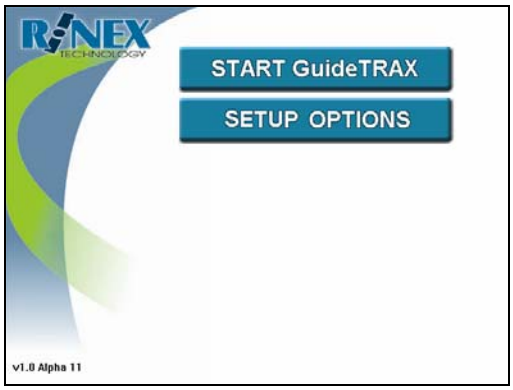


Figure 8-1: The Startup Window of the Launcher

Overview: The Launcher buttons and their functions are listed below:

Item	Description
Start GuideTRAX	Tapping the Start GuideTRAX button will close the Launcher program and open the GuideTRAX software.
Setup Options	Tapping the Setup Options button will open the Launcher Main Window. See Section 8.2.1 for more details.

8.2.1 Launcher Main Window

Figure 8-2: The Launcher Main Window

Overview: The Launcher buttons and their functions are listed below:

Item	Description
Start GuideTRAX	Tapping the Start GuideTRAX button will close the Launcher program and open the GuideTRAX software.
Upgrade Software	Tapping the Upgrade Software button will attempt to look on the USB storage device for an install folder. The Launcher will then proceed to copy any files in the install folder to the system.
Reset Options	Tapping the Reset Options button will display a set of reset options that can be selected. See section 8.2.2 for more details.
Utilities	Tapping the Utilities button will open a window from which a password can be entered. The correct password must be entered before the Utilities menu can be accessed. Please call RINEX if you wish to access the Utilities menu. The Utilities menu contains access to various troubleshooting utilities. See Section 8.2.3 for more details.
Calibrate	The Calibrate button allows the touch screen to be calibrated. The appropriate calibration program for your touch screen will be opened when the Calibrate button is tapped. Follow the onscreen instructions of the calibration program to calibrate your touch screen.
Restart System	Tapping the Restart System button will restart the system.

8.2.2 Reset Options

Figure 8-3: The Reset Options Window

WARNING: Resetting the system will delete data on the system.

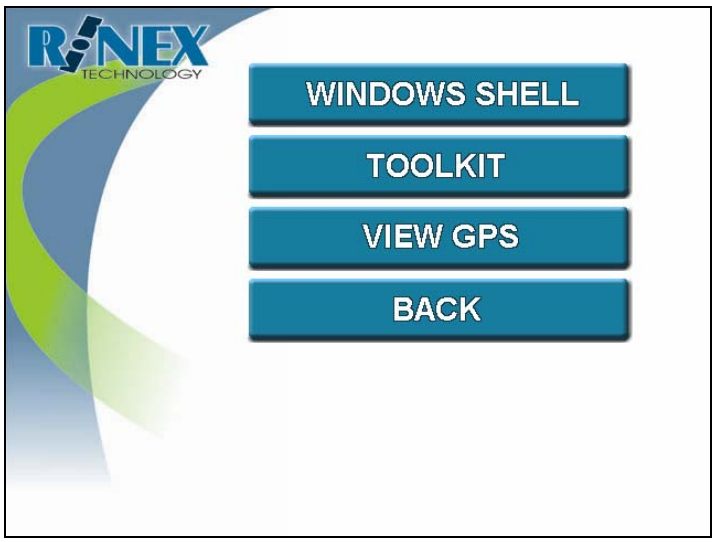
Overview: Reset Options allows the system to be reset so that the factory settings are restored. The two reset options are explained below:

Item	Description
Soft Reset	Tapping the Soft Reset button will perform a soft reset on the system. Any data that has been recorded with the GuideTRAX software will be removed to a temporary folder for later analysis. All settings will remain on a soft reset. After a soft reset, the system will reboot.
Hard Reset	Tapping the Hard Reset button will restore the factory settings. All data that has been recorded with the GuideTRAX software will be deleted and all settings will be set back to the default factory settings. After a hard reset, the system will reboot.
Back	Tapping the Back button will return to the Launcher Main window.

Hints and Tips:

- *You will be asked to confirm the actions of soft and hard reset.*

8.2.3 Utilities



Item	Description
Windows Shell	Tapping the Windows Shell button will display the Windows Shell interface from which Windows commands can be entered. To return to Launcher if the Windows Shell is opened simply type “Exit” using a keyboard.
Toolkit	Tapping the Toolkit button will open the Toolkit program for use with your GPS receiver. The Toolkit program will allow you to view the serial number of your GPS receiver and the expiry date. The supported GPS receivers for use with Toolkit are: Ag114, 3000L, G12 and GEM receivers.
View GPS	Tapping the View GPS button will display the current NMEA string being received from the GPS receiver. Use this tool to test the connection with the GPS receiver on the GPS port of the Interface Box.
Back	Tapping the Back button will return to the Launcher Main Window.

9

The Menu System

The GuideTRAX V3 software is operated and configured by a menu system. The menu comprises of a choice of buttons which will have an action upon the V3 software. As previously described the button is accessed by touching or tapping the appropriate part of the screen.

The V3 menu typically comprises of four or five buttons aligned along the right hand side of the screen. Touching anyone of these buttons will either activate the function associated with the button or lead to a sub-menu. A sub-menu is similar to the main menu whereby touching the button may either activate a function a function or lead to a further sub-menu.

This manual refers to the Main menu as that which is shown when the system is first started.

A useful rule of thumb is that if the menu does not show a **BACK** button then the system is at the Main menu.

This section describes the various menus and sub-menus as to the functionality of the particular button and the options that may be set from these buttons.

9.1 Menu Layout

One of the integral philosophies of the V3 menu is that regardless of the software version, the HL, HT, or HR, the menu system should be essentially the same. This is to ensure that as users requirements are expanded there is a common structure and immediate recognition of the menu layout.

Consequently some of the buttons will have no effect in particular versions of the GuideTRAX V3 software. In these cases the button is typically greyed out indicating to the user that the button is not available or has no effect in that particular version of the V3 software.

The HR menu is not presented within this manual as it is dealt with in the HR User Manual (P/n 1-1243).

The HL menu is illustrated in Figure 9-1 with the Main menu shown across the page and the sub-menus are shown down the length of the page. The functions that are not available are shown as a transparent button.

The HT menu is illustrated in Figure 9-2 with the Main menu shown across the page and the sub-menus are shown down the length of the page. The functions that are not available are shown as a transparent button.

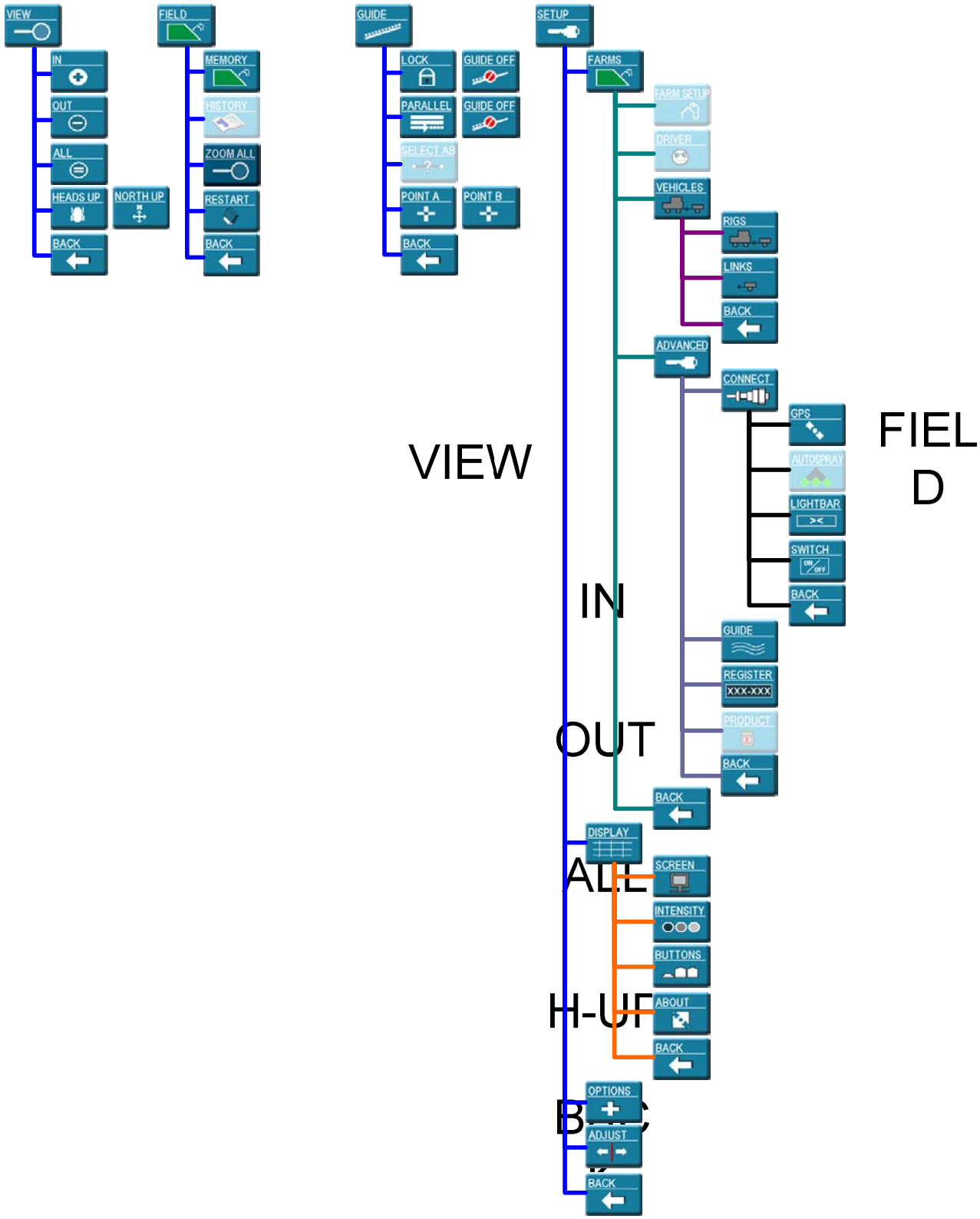


Figure 9-1: The HL Menu Layout

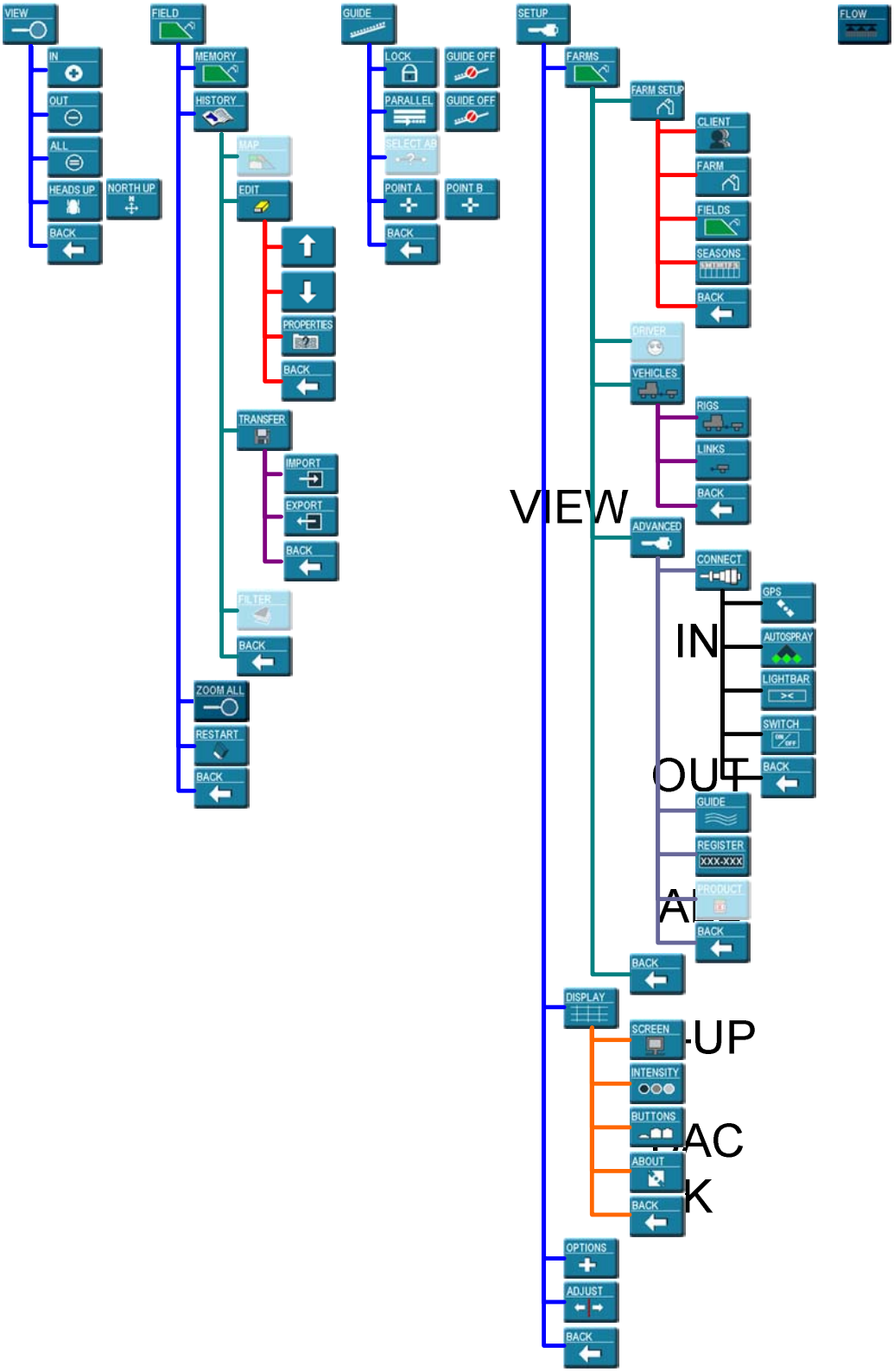


Figure 9-2: The HT Menu

9.2 The Main Menu

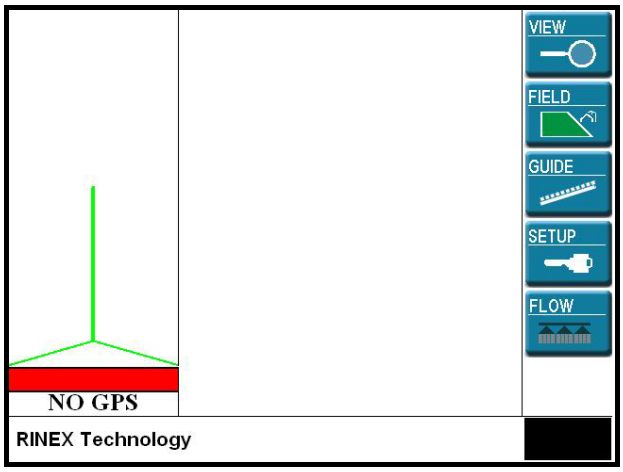


Figure 9-3 The Main Menu

Overview: The MAIN Menu, as illustrated in Figure 9-3 is always displayed when the Saturn “H” system is started. The Main menu provides access to the sub-menus for configuration and operation of the system.

Name	Button	Function
VIEW		The VIEW button accesses the View sub-menu which allows the map screen view to be changed.
FIELD		The FIELD button accesses the Field sub-menu to start stop, save and view field information.
GUIDE		The GUIDE button accesses the Guide sub-menu to activate all forms of vehicle guidance.
SETUP		The SETUP button accesses the Setup sub-menu which allows the system to be configured for optional devices and user preference.
FLOW		The FLOW button accesses the Flow window to allow data entry.

9.2.1 View

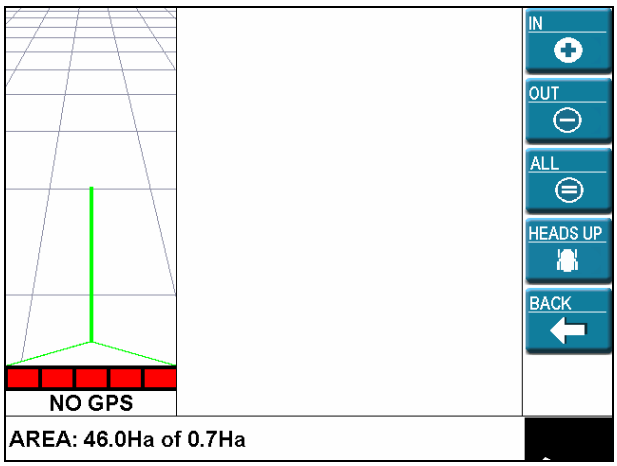


Figure 9-4: The View Menu

Overview: The VIEW Menu, as illustrated in Figure 9-4 configures the display characteristics of the Map Screen.

Name	Button	Function
IN		The IN button magnifies the image on the Map Screen based upon the central point of the screen.
OUT		The OUT button shrinks the image on the Map Screen based around the central point of the screen.
ALL		The ALL button displays all of the current field on the Map Screen. If there is no treated area in the current field, the button will have no effect.
HEADS UP / NORTH UP		This is a toggle button, it can be either HEADS UP or NORTH UP. The button toggles the Map Screen between the two modes, Heads or North Up. The Map Screen will be in the Heads Up mode when the HEADS UP button is displayed.
BACK		The BACK button returns the system to the Main Menu.

9.2.2 Field

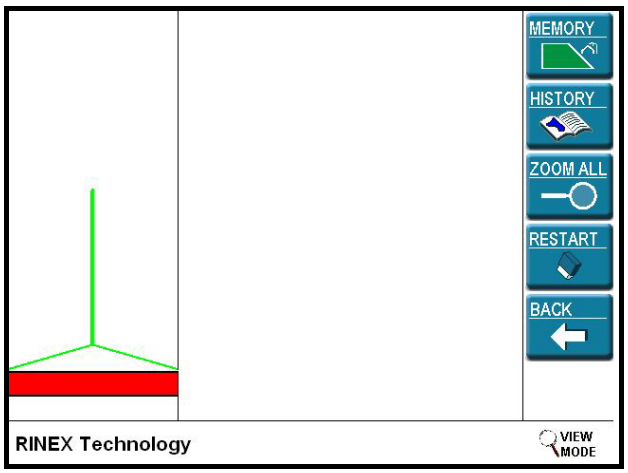


Figure 9-5: The Field Menu

Overview: The FIELD Menu, as illustrated in Figure 9-5 allows fields to be started, stopped, saved and to view information pertaining to fields.

Name	Button	Function
MEMORY		The MEMORY button selects the Virtual Memory to change the current memory slot.
HISTORY		The HISTORY button selects the Treatment History window and allows field information to be saved or viewed.
ZOOM ALL		The ZOOM ALL button displays all of the current field on the Map Screen.
RESTART		The RESTART button clears information stored in the current field.
BACK		The BACK button returns the system to the Main Menu.

9.2.3 Guide

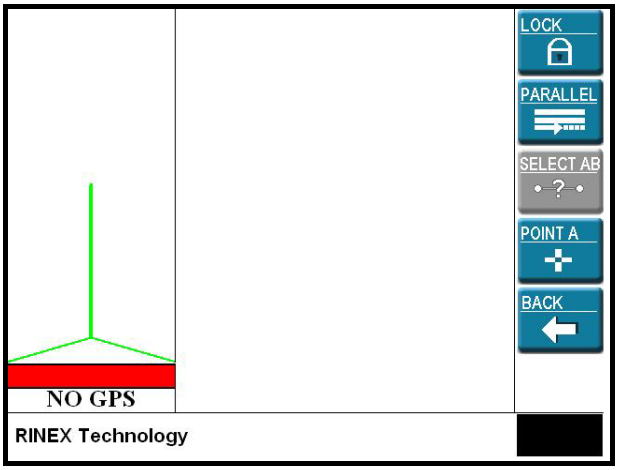


Figure 9-6: The Guide Menu

Overview: The GUIDE Menu as illustrated in Figure 9-6 allows the system to be configured and selected for vehicle guidance.

Name	Icon	Function
LOCK / GUIDE OFF		This is a toggle button, it either invokes or cancels Lock guidance. To invoke guidance the LOCK button will be visible, once activated it will toggle the button to GUIDE OFF. To cancel Lock guidance the GUIDE OFF button will be visible, it will then toggle the button to LOCK.
PARALLEL / GUIDE OFF		This is a toggle button, it either invokes or cancels parallel guidance. To invoke guidance the PARALLEL button will be visible, once activated it will toggle the button to GUIDE OFF. To cancel parallel guidance the GUIDE OFF button will be visible, it will then toggle the button to PARALLEL.
SELECT AB		This function is not available in the HL or HT software.

Name	Icon	Function
POINT A/ POINT B		This is a toggle button, it either sets Point A or Point B for parallel guidance. To set guide Point A the POINT A button will be visible, once set the button will toggle to POINT B. Once Point B has been set the button toggle to Point A.
BACK		The BACK button returns the system to the Main Menu.

9.2.4 Setup

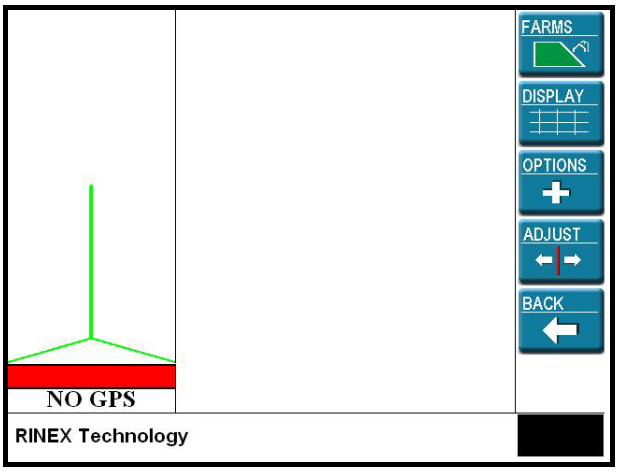


Figure 9-7: The Setup Menu

Overview: The SETUP Menu, as illustrated in Figure 9-7 allows the system to be configured for optional devices and user preferences.

Name	Button	Function
FARMS		The FARM button selects the FARM sub-menu to allow configuration of farms, field, products, vehicles and operators.
DISPLAY		The DISPLAY button selects the Display sub-menu to allow configuration of the display screen.
OPTIONS		The OPTIONS button selects the Options Window where optional system devices can be enabled.
ADJUST		The ADJUST button selects the GPS Adjust Window where the GPS guidelines can be adjusted.
BACK		The BACK button returns the system to the previous menu.

9.3 Field Sub-Menus

The FIELD Menu allows fields to be started, stopped, saved and to view information pertaining to fields. The FIELD sub-menus are selected from one of the FIELD MENU buttons, as illustrated in Figure 9-8: The FIELD Menu Buttons.

Figure 9-8: The FIELD Menu Buttons

9.3.1 Virtual Memory

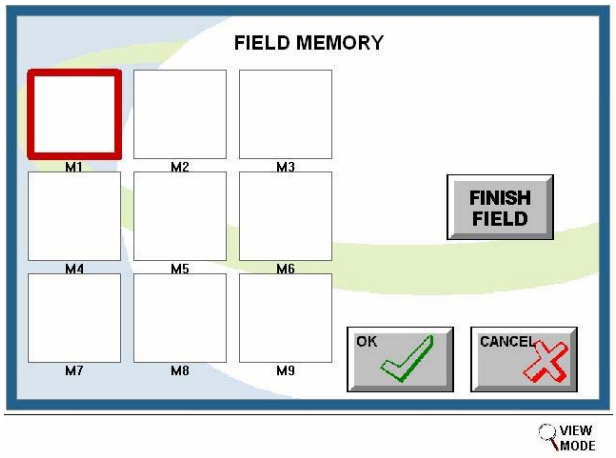


Figure 9-9: The FIELD MEMORY Window

Overview: The Virtual Memory Window, as shown in **Figure 9-9** allows selection of a memory slot to be used as the current field. Memory slots which contain treatment data will display a miniature image of the treatment data recorded in the field.

Access: **FIELD** **MEMORY**

Name	Function
M1 to M9	The memory slots are represented as squares (not buttons) and are labelled M1 to M9 respectively. The selected memory slot will be indicated with a red border as illustrated in **Figure 9-9**.
FINISH FIELD	The FINISH FIELD button will record the treatment data in the current field to the permanent memory, and then clear the memory slot.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.3.2 History

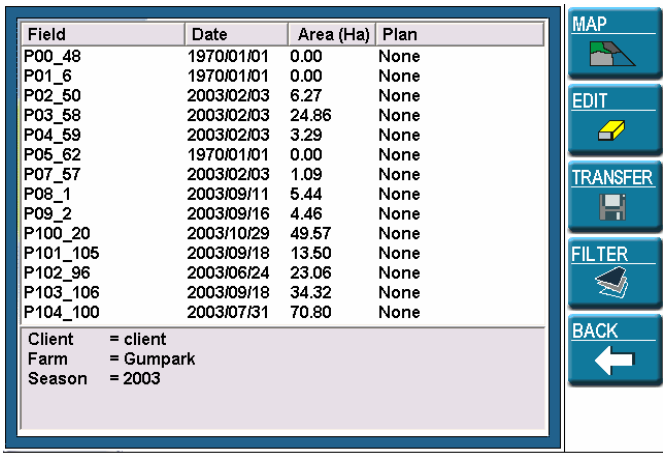


Figure 9-10: The Treatment History Window

Overview: The Treatment History Menu, as shown in **Figure 9-10** provides access to operations related to loading, saving and viewing treatment data.

Access: FIELD HISTORY

Name	Button	Function
MAP		This function is not available in the HT software.
EDIT		The EDIT button will select a sub-menu to display a summary of any selected field.
TRANSFER		The TRANSFER button will select a sub-menu for transferring data to and from the Saturn “H” system.
FILTER		This function is not available in the HT software.
Back		The BACK button returns the system to the previous menu.

9.3.2.1 Edit

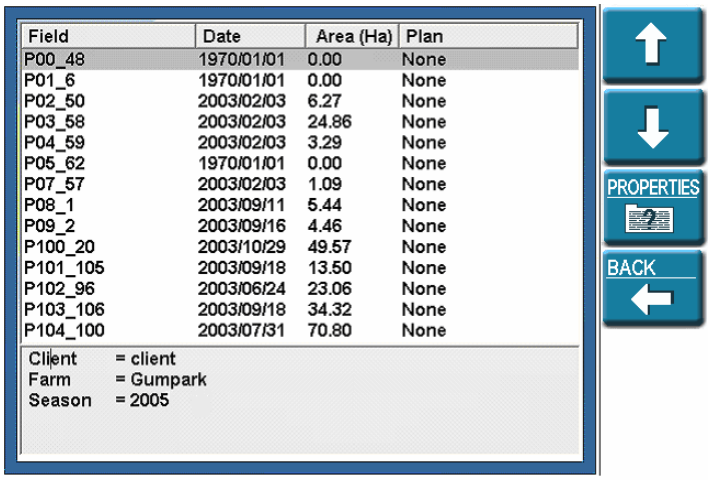


Figure 9-11: The Edit Treatment Window

Overview: The Edit Treatment, as shown in **Figure 9-11** allows individual treatments to be viewed and their recorded information can be examined.

Access: FIELD HISTORY EDIT

Name	Button	Function
UP		The UP button will highlight the next field up in the list as the selected field.
DOWN		The DOWN button will highlight the next field down in the list as the selected field.
PROPERTIES		The PROPERTIES button will display a summary of treatment data for the selected field.
Back		The BACK button returns the system to the previous menu.

9.3.2.2 Transfer

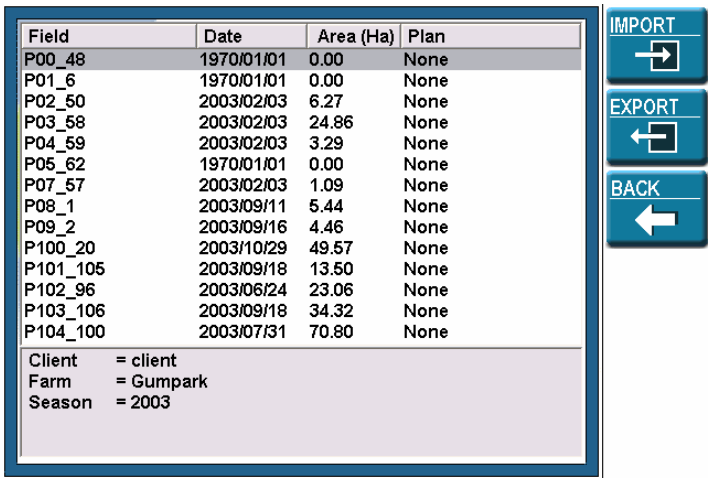


Figure 9-12: The Transfer Menu Window

Overview: The TRANSFER Menu as shown in **Figure 9-12** allows importing and exporting treatment and configuration information to an USB memory device.

Access: FIELD HISTORY TRANSFER

Name	Button	Function
IMPORT		The IMPORT button will transfer data from a USB memory stick in the Saturn H system to the permanent farm memory.
EXPORT		The EXPORT button will transfer data to the USB memory stick in the Saturn H system from the permanent farm memory.
Back		The BACK button returns the system to the previous menu.

9.3.3 Restart Field

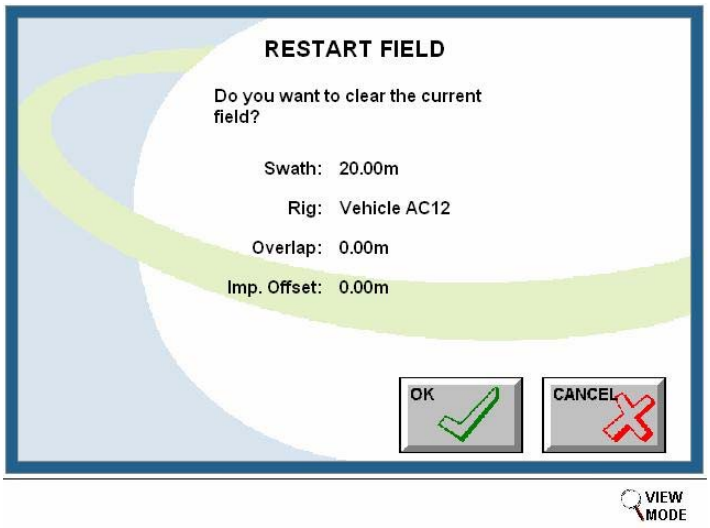


Figure 9-13: The RESTART FIELD Window

Overview: The RESTART FIELD Window, see Figure 9-13 clears data currently stored in the field. It also displays the vehicle and guidance parameters that pertain to data for the current field.

Access: FIELD RESTART

Name	Function
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.4 Setup Sub-Menus

The SETUP Menu allows the system to be configured for specific farm, field, vehicle and operator requirements as well as individual preferences. The SETUP sub-menus are selected from one of the SETUP MENU buttons, as illustrated in Figure 9-14.

Figure 9-14: The SETUP Menu Buttons

9.4.1 Farms

Figure 9-15: The FARMS window

Overview: The FARMS Menu, see **Figure 9-15** is for entering of farms, drivers, vehicles and associated information.

Access: **SETUP** **FARMS**

Name	Button	Function
FARM SETUP		The FARM SETUP button will select the sub-menu for selection of clients and relevant data.
DRIVER		This function is not available in the HL or HT software.
VEHICLES		The Vehicles button will select the sub-menu for configuration of rigs and links.
ADVANCED		The ADVANCED button will display a further sub-menu for configuration of features and add-on peripherals.
Back		The BACK button returns the system to the previous menu.

9.4.1.1 Farm Setup

Figure 9-16: The Farm Setup Menu

Overview: The FARMS SETUP Menu, see **Figure 9-16** is for entering of farms, fields and related information.

Access: **SETUP** **FARMS** **FARM SETUP**

Name	Button	Function
CLIENT		The CLIENT button will select the Client Window for selection and editing of clients.
FARM		The FARM button will select the Farm Window for selection and editing of farms.
FIELDS		The FIELDS button will select the Fields Window for selection and editing of fields.
SEASONS		The SEASONS button will select the Seasons Window for selection and editing of seasons.
Back		The BACK button returns the system to the previous menu.

9.4.1.2 Vehicles

Figure 9-17: The Vehicles Menu

Overview: The VEHICLES Menu, see **Figure 9-17** is for entering information on plant and equipment on the farm.

Access: **SETUP** **VEHICLES** **FARM SETUP**

Name	Button	Function
RIGS		The RIGS button will select the Rigs Window for selection and editing of rigs.
LINKS		The LINKS button will select the Links Window for selection and editing of links

9.4.1.3 Advanced

Figure 9-18: The Advanced menu

Overview: The ADVANCED Menu, see **Figure 9-18** allows configuration of parameters that control the Saturn "H" system.

Access: **SETUP** **FARMS** **ADVANCED**

Name	Button	Function
CONNECT		The CONNECT button will select the Connect sub-menu for configuring of peripheral equipment connected to the system.
GUIDE		The GUIDE button will select the Guide Setup Window for selection and editing of guidance options.
REGISTER		The REGISTER button will select the Register Window for entering the system registration code.
PRODUCT		This function is not available in the HL or HT software.
BACK		The BACK button returns the system to the previous menu.

9.4.2 Display

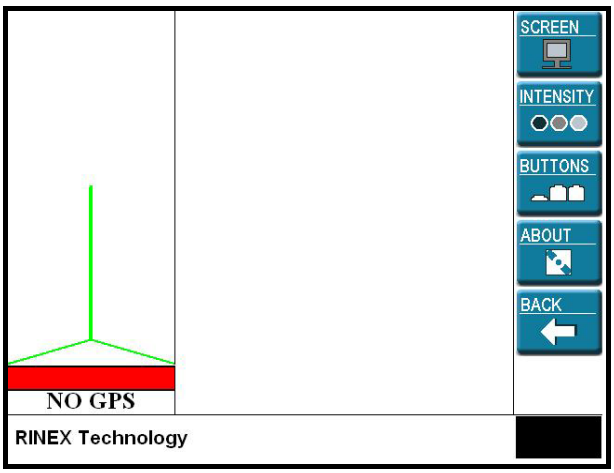


Figure 9-19: The Display menu

Overview: The DISPLAY Menu, see Figure 9-19 allows the screen and connected devices to be configured for user preferences.

Access: **SETUP** **DISPLAY**

Name	Button	Function
SCREEN		The SCREEN button will display the Screen Setup window. See Section XXX
INTENSITY		The INTENSITY button will display the lightbar intensity window.
BUTTONS		The BUTTONS button will display the Buttons Setup Window for the external button box (optional).
ABOUT		The ABOUT button will display the version of software and system information.
BACK		The BACK button returns the system to the previous menu.

9.4.2.1 Screen

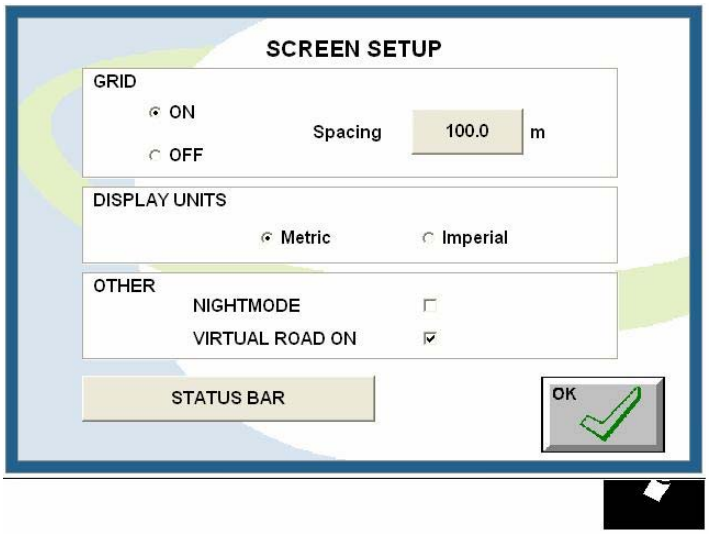


Figure 9-20: The Screen Setup Window

Overview: The SCREEN SETUP Window, see **Figure 9-20** allows the screen status and modes to be configured for user preference.

Access: **SETUP** **DISPLAY** **SCREEN**

Name	Function
GRID	The GRID options button selects the status of the grid on the map screen.
GRID Spacing	The GRID Spacing button selects the keyboard to enter a value for he grid spacing.
DISPLAY UNITS	The DISPLAY UNITS options button selects the status of the display units for the system.
OTHER	The check boxes listed in this section control the status of the screen modes and operation.
STATUS BAR	The STATUS BAR button selects the Status Bar Window for selection of information to be displayed.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.4.2.2 Intensity

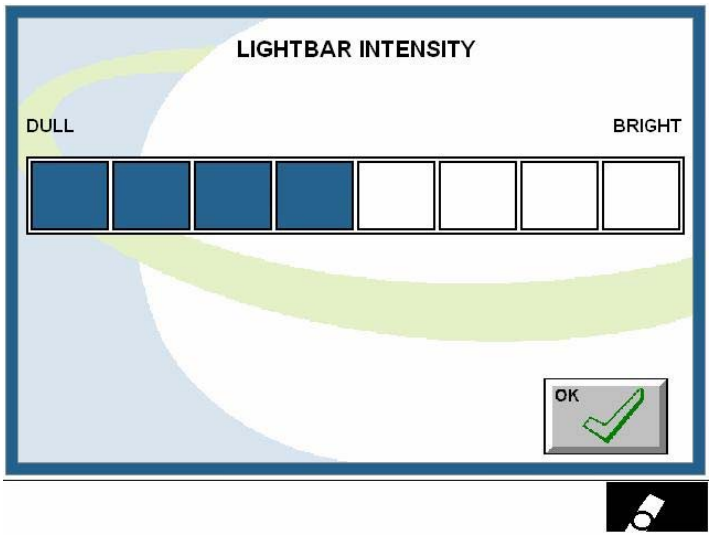


Figure 9-21: The Lightbar Intensity window

Overview: The LIGHTBAR INTENSITY Window, see **Figure 9-21** controls the brightness of the optional lightbar.

Access: **SETUP** **DISPLAY** **INTENSITY**

Name	Function
DULL BRIGHT	The squares between DULL and BRIGHT control the brightness (intensity) of the optional lightbar.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.4.2.3 Buttons

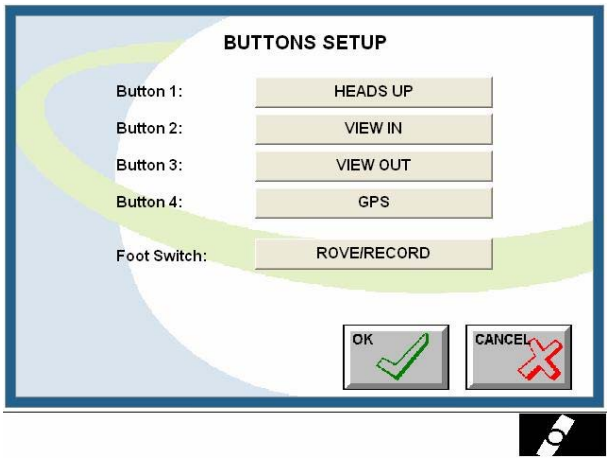


Figure 9-22: The Buttons Setup window

Overview: The BUTTONS SETUP Window, see **Figure 9-22** controls the operation of the optional button boxes which may be attached to the Saturn "H" system.

Access: **SETUP** **DISPLAY** **BUTTONS**

Name	Function
BUTTON 1	The BUTTON 1selects the Button selection Window. A function for the Button may be selected, if no Button box is attached the setting will have no effect.
BUTTON 2	The BUTTON 2selects the Button selection Window. A function for the Button may be selected, if no Button box is attached the setting will have no effect.
BUTTON 3	The BUTTON 3selects the Button selection Window. A function for the Button may be selected, if no Button box is attached the setting will have no effect.
BUTTON 4	The BUTTON 4selects the Button selection Window. A function for the Button may be selected, if no Button box is attached the setting will have no effect.
FOOT SWITCH	The FOOT SWITCH selects the Button selection Window. A function for the Foot Switch may be selected, if no Foot Switch is attached the setting will have no effect.

Name	Function
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
CANCEL	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.4.2.4 About

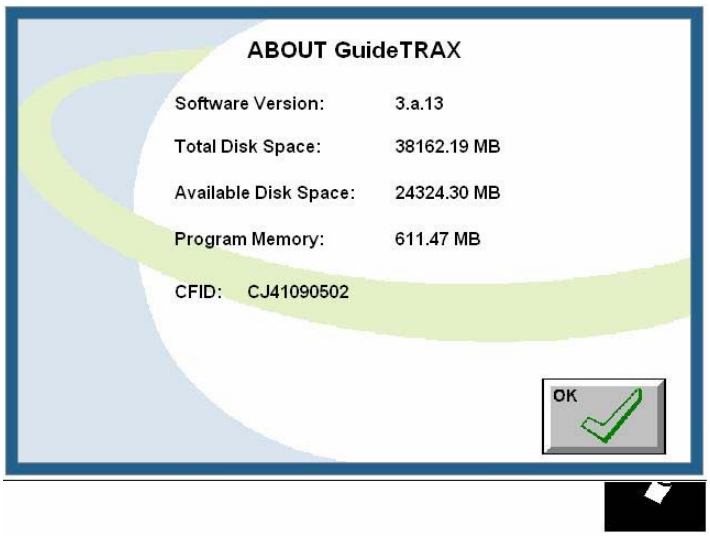


Figure 9-23: The About Window

Overview: The ABOUT GuideTRAX Window, see **Figure 9-23** displays the version of software and pertinent information on the Saturn "H" system.

Access: **SETUP** **DISPLAY** **ABOUT**

Name	Function
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.4.3 Options

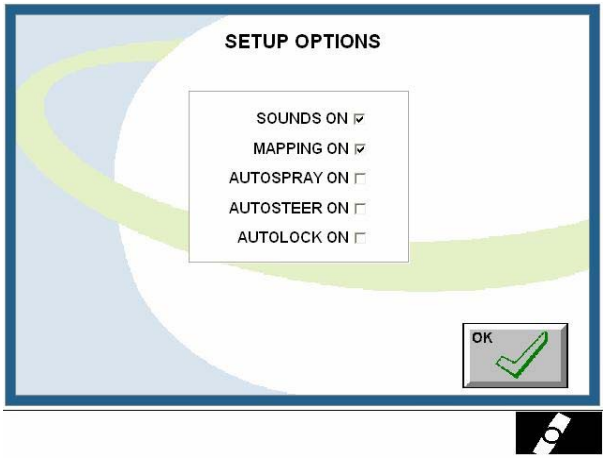


Figure 9-24: The Setup Options window

Overview: The SETUP OPTIONS Window, see **Figure 9-24** allows a list of system functions to be enabled as necessary. The function is enabled when the checkbox is ticked. If the option is greyed out then the option has not been purchased, contact RINEX for purchasing options.

Access: **SETUP** **OPTIONS**

Name	Function
SOUNDS ON	The SOUNDS ON option when enabled will sound a noise on the system if an alarm has been triggered.
MAPPING ON	The MAPPING ON option when enabled will display farm and field boundaries, flags and obstacles.
AUTOSPRAY ON	The AUTOSPRAY ON option when enabled will control the attached RINEX AutoSPRAY system.
AUTOSTEER ON	The AUTOSTEER ON option when enabled will control the attached RINEX AutoSTEER system.
AUTOLOCK ON	The AUTOLOCK ON option when enabled will constantly use Lock guidance in a field.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.4.4 Adjust

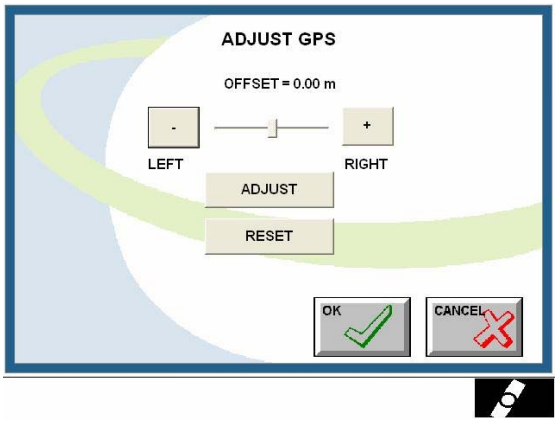


Figure 9-25: The GPS Adjust window

Overview: The ADJUST GPS Window, see **Figure 9-25** allows the GPS guideline to be temporarily adjusted for inaccuracies with GPS repeatability.

Access: **SETUP** **ADJUST**

Name	Function
LEFT (-)	The LEFT button will shift the guideline 1cm to the left. Holding the button will rapidly increase the distance, the maximum is 0.5m.
RIGHT (+)	The RIGHT button will shift the guideline 1cm to the right. Holding the button will rapidly increase the distance, the maximum is 0.5m.
ADJUST	The ADJUST button will shift the guideline to the present location of the vehicle. It is assumed that the vehicle is positioned exactly on the centre of the physical line.
RESET	The RESET button will clear any offsets applied in the GPS Adjust Window.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5 Advanced Setup Sub-Menus

The SETUP menu allows configuration of the system for user preferences. Many of these functions are only used on several occasions and consequently they are not used on a daily basis. The access to these functions is detailed in this section.

9.5.1 Farm Setup

Figure 9-26: The Farm Setup Menu

Overview: The Farm Setup menu, see Figure 9-26 allows the client, farms, fields and cropping seasons to be configured.

Access: **SETUP** **FARMS** **FARM SETUP**

Name	Button	Function
CLIENT		The CLIENT button will select the Client Setup window.
FARM		The FARM button will select the Farm Setup window.
FIELDS		The FIELDS button will select the Fields Setup window.
SEASONS		The SEASONS button will select the Seasons Setup window.
BACK		The BACK button returns the system to the previous menu.

9.5.1.1 Client

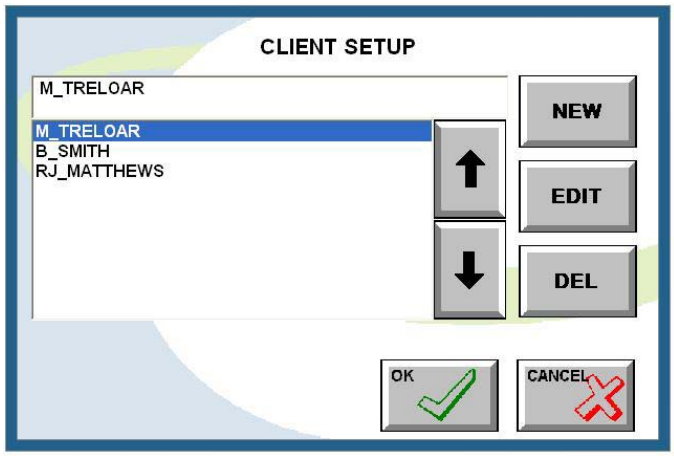


Figure 9-27 CLIENT SETUP Window

Overview: The CLIENT SETUP Window as shown in Figure 9-28allows the Client details to be entered and edited as required.

Access: **SETUP** **FARMS** **FARM SETUP** **CLIENT**

Name	Function
(UP)	The Up button moves the selection bar up the list of available clients.
(DOWN)	The Up button moves the selection bar down the list of available clients
NEW	The New button will select the keyboard to allow entry of a new client.
EDIT	The Edit button will select the keyboard so the selected client maybe edited
DEL	The Delete button will select the warning message Window so that the selected client maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.1.2 Farm

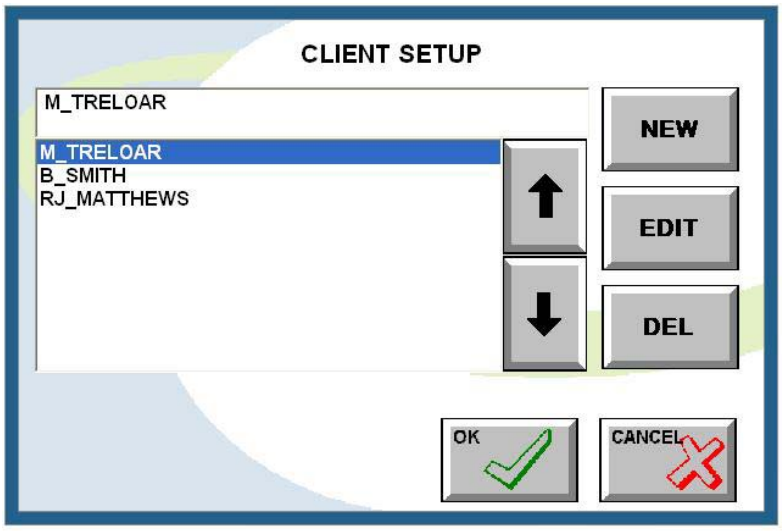


Figure 9-28 FARM SETUP Window

Overview: The FARM SETUP Window as shown in Figure 9-28 allows the Farm details to be entered and edited as required.

Access: **SETUP** **FARMS** **FARM SETUP** **FARM**

Name	Function
↑ (UP)	The Up button moves the selection bar up the list of available farms.
↓ (DOWN)	The Up button moves the selection bar down the list of available farms
NEW	The New button will select the keyboard to allow entry of a new farm.
EDIT	The Edit button will select the keyboard so the selected farm maybe edited
DEL	The Delete button will select the warning message Window so that the selected farm maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.1.3 Fields

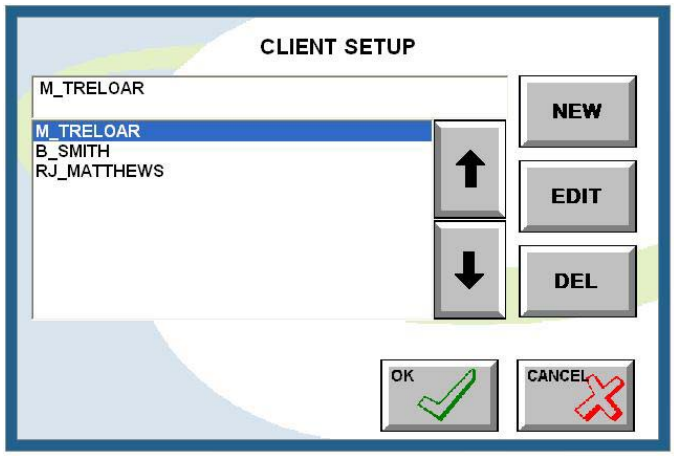


Figure 9-29 FIELDS SETUP Window

Overview: The FIELDS SETUP Window as shown in Figure 9-29 allows the fields details to be entered and edited as required.

Access: **SETUP** **FARMS** **FARM SETUP** **FIELDS**

Name	Function
(UP)	The Up button moves the selection bar up the list of available fields.
(DOWN)	The Up button moves the selection bar down the list of available fields
NEW	The New button will select the keyboard to allow entry of a new field.
EDIT	The Edit button will select the keyboard so the selected field maybe edited
DEL	The Delete button will select the warning message Window so that the selected client maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.1.4 Seasons

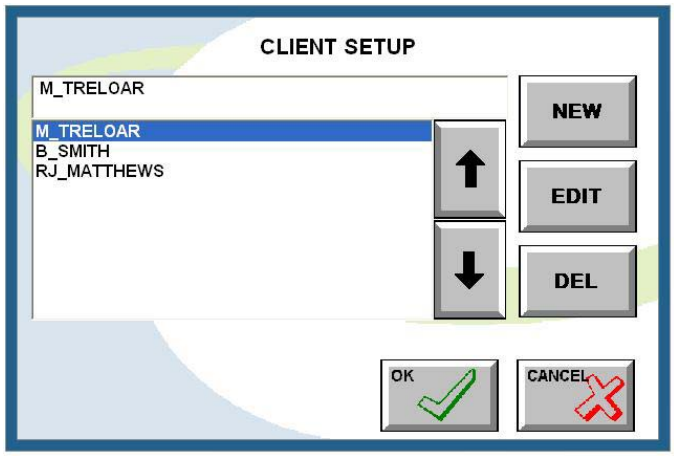


Figure 9-30 SEASON SETUP Window

Overview: The SEASON SETUP Window as shown in Figure 9-30 allows the Season details to be entered and edited as required.

Access: **SETUP** **FARMS** **FARM SETUP** **CLIENT**

Name	Function
(UP)	The Up button moves the selection bar up the list of available seasons.
(DOWN)	The Up button moves the selection bar down the list of available seasons
NEW	The New button will select the keyboard to allow entry of a new season.
EDIT	The Edit button will select the keyboard so the selected season maybe edited
DEL	The Delete button will select the warning message Window so that the selected season maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.2 Vehicles & Links

9.5.2.1 Rigs

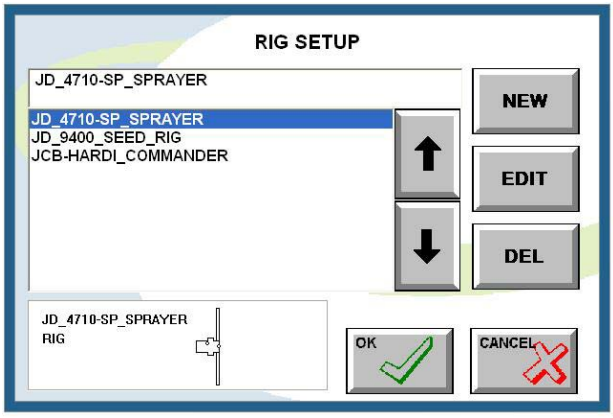


Figure 9-31 RIG SETUP Window

Overview: The RIG SETUP Window as shown in Figure 9-31 allows the Rig details to be entered and edited as required.

Access: **SETUP** **FARMS** **VEHICLE** **RIGS**

Name	Function
↑ (UP)	The Up button moves the selection bar up the list of available rigs.
↓ (DOWN)	The Up button moves the selection bar down the list of available rigs
NEW	The New button will select the New Rig Window to allow entry of a new rig.
EDIT	The Edit button will select the Edit Rig Window so the selected rig maybe edited
DEL	The Delete button will select the warning message Window so that the selected rig maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **EDIT RIG**

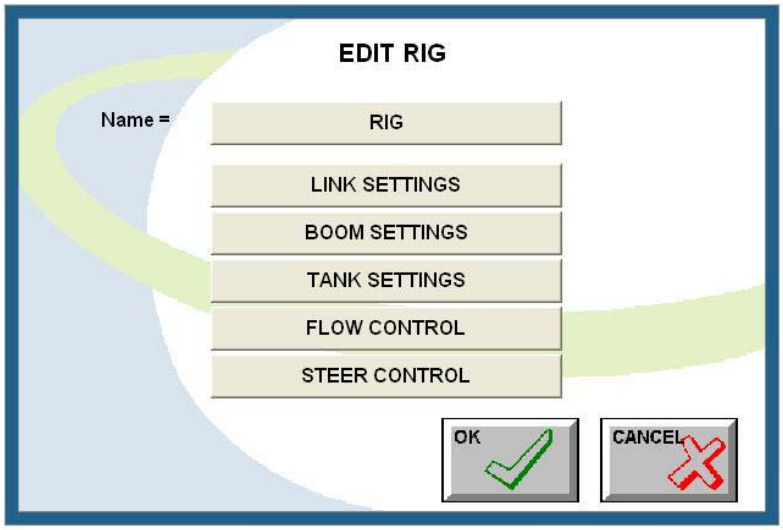


Figure 9-32: The Edit Rig window

Overview: The Edit Rig Window, shown in Figure 9-33 allows the individual parameters of the rig to be configured

Access: **SETUP** **FARM** **VEHICLES** **RIGS** **NEW**

Name	Function
Name	The Name button selects the alphanumeric keyboard to enter the name of the rig.
LINK SETTINGS	The Link Settings Button selects the Link Settings Window to enter the number and name of links that make up the rig.
BOOM SETTINGS	The Boom Settings Button selects the Boom Settings Window to enter the number of sections and their respective widths that make up the boom associated with the rig.
TANK SETTINGS	The Tank Settings Button selects the Tank Settings Window to enter the number of tanks and their respective capacities that make up the rig.

Name	Function
FLOW CONTROL	The Flow Control button selects the Flow Control Settings button to select the flow controller and its respective ON and OFF latency values, that is used on the rig.
STEER CONTROL	The Steer Control button selects the Steer Control Settings button to select the Steer that is used on the rig.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **BOOM SETTINGS**

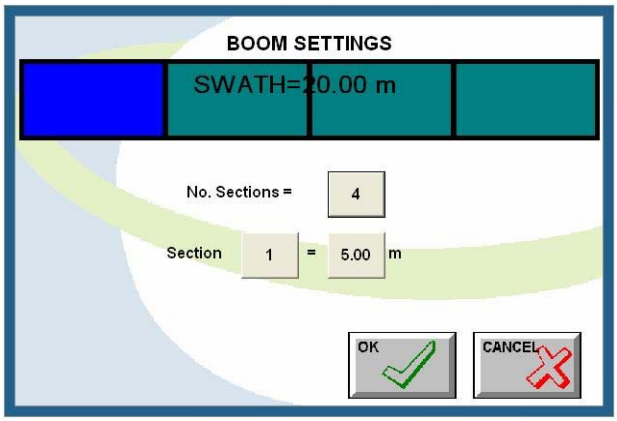


Figure 9-33: The Boom Settings window

Overview: The Boom Settings window, shown in **Figure 9-33** allows the number of boom sections and the width of each boom section to be changed.

Access: **SETUP** **FARM** **VEHICLES** **RIGS**

BOOM SETTINGS

Name	Function
No. Sections	The No. Sections button displays the Number of Boom Sections window from which the number of boom sections is changed.
Section	The Section button toggle between each boom section, displaying the width of the section on the adjacent button
Section Width	The Width button displays the numeric keyboard window. The width of the currently selected section can be changed.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **Number of Boom Sections**

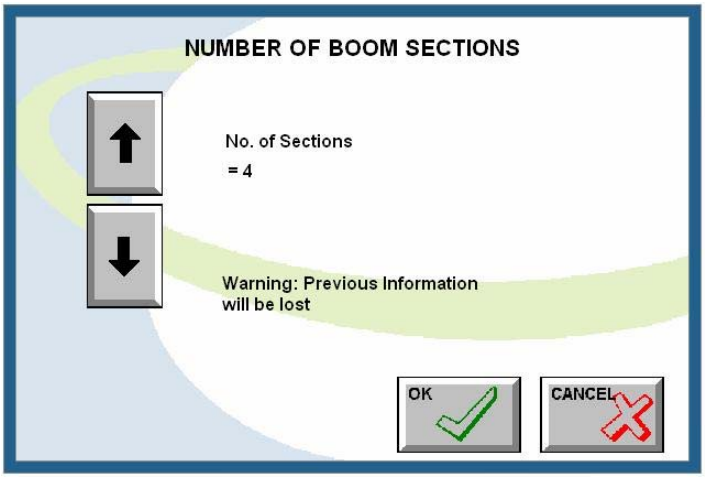


Figure 9-34: The Number of Boom Sections window

Overview: The NUMBER of BOOM SECTIONS Window as shown in **Figure 9-34** allows the number of sections in the boom to be configured for a specific spray boom.

Access: **SETUP** **FARM** **VEHICLES** **RIGS**

BOOM SETTINGS **No.of SECTION**

Name	Function
(UP)	The Up button increases the number of boom sections by one until a maximum of 32 sections is reached.
(DOWN)	The Down button decreases the number of boom sections by one until a minimum of one section is reached.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **TANK SETTINGS**

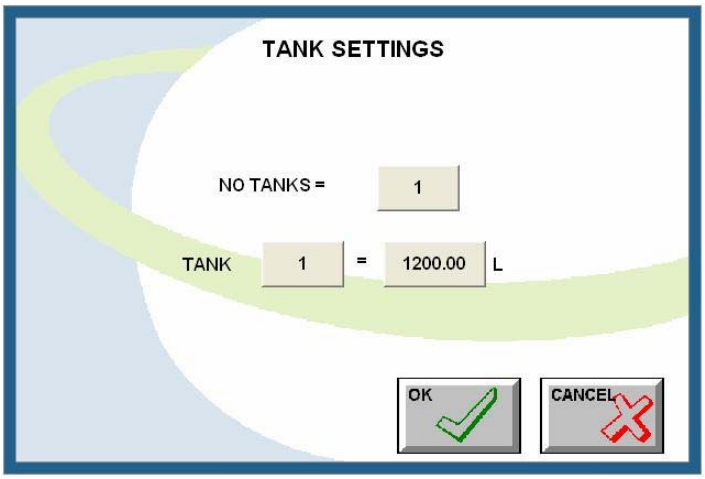


Figure 9-35: The Tank Settings window

Overview: The Tank Settings window, shown in **Figure 9-35** allows the number tanks and the capacity of each tank to be changed.

Access: **SETUP** **FARM** **VEHICLES** **RIGS** **TANK SETTINGS**

Name	Function
NO TANKS	The NO TANKS button displays the Number of Tanks Window from which the number of tanks can be changed.
TANK	The TANK button toggles between each tank, displaying the capacity of the selected tank.
Tank Capacity	The Capacity button displays the numeric keyboard window. The capacity of the currently selected tank can be changed.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **FLOW CONTROL**

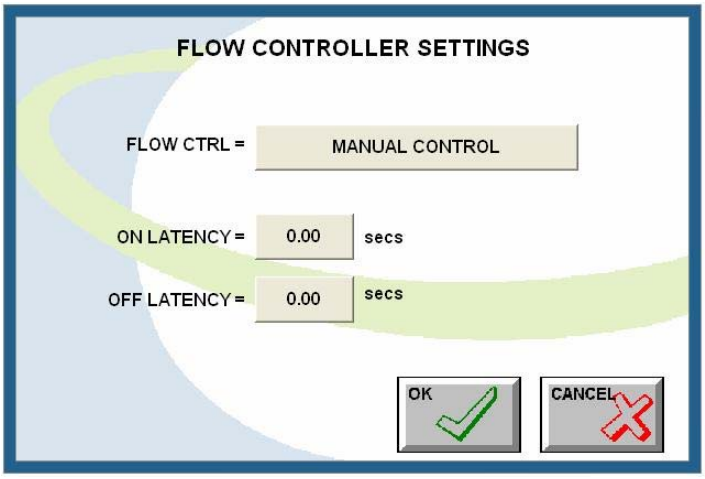


Figure 9-36: The Flow Controller Settings window

Overview: The Flow Controller Settings window, shown in Figure 9-36 allows the type of flow controller to be selected and the latency value to be configured for the specific controller.

Access: **SETUP** **FARM** **VEHICLES** **RIGS**

FLOW CONTROLLER

Name	Function
FLOW CTRL	The Flow Ctrl button displays a list of compatible flow controllers. The required flow controller can be selected from the available list of controllers.
ON LATENCY	The ON Latency button display a numeric keyboard window for entry of the ON Latency.
OFF LATENCY	The OFF Latency button display a numeric keyboard window for entry of the OFF Latency.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

- **STEER CONTROL**

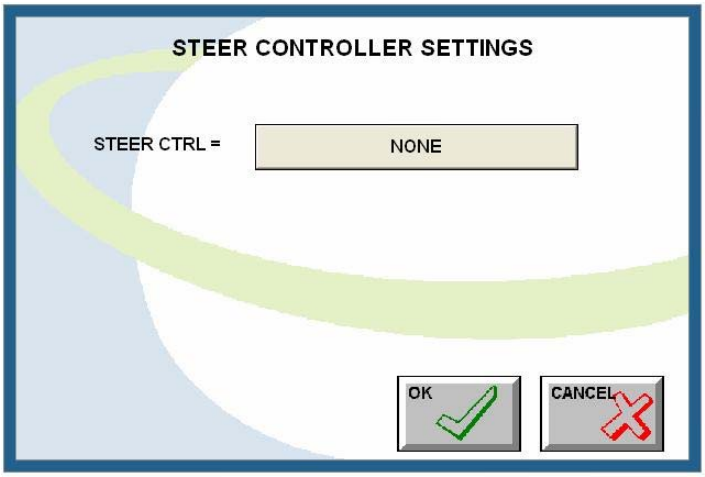


Figure 9-37: The Steer Controller Settings window

Overview: The Steer Controller Settings window, shown in **Figure 9-37** allows the type of steer controller to be selected.

Access: **SETUP** **FARM** **VEHICLES** **RIGS** **STEER CONTROLLER**

Name	Function
STEER CTRL	The Steer Ctrl button displays a list of compatible Steer controllers. The required Steer controller can be selected from the list of controllers.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.2.2 Links

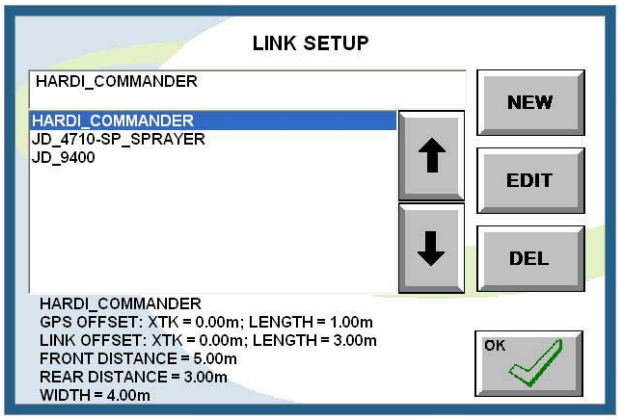


Figure 9-38 LINK SETUP Window

Overview: The LINK SETUP Window as shown in Figure 9-38allows the Vehicle and Implement Link details to be entered and edited as required.

Access: **SETUP** **FARMS** **FARM SETUP** **CLIENT**

Name	Function
(UP)	The Up button moves the selection bar up the list of available links.
(DOWN)	The Up button moves the selection bar down the list of available links
NEW	The New button will select the Link Wizard to allow entry of a new link.
EDIT	The Edit button will select the Link Wizard so the selected link maybe edited
DEL	The Delete button will select the warning message Window so that the selected link maybe deleted.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.3 Advanced

9.5.3.1 Connect

Figure 9-39: The Connect menu

Overview: The Connect sub-menu, as shown in **Figure 9-39** gives access to system settings related to GPS setup, AutoSPRAY, Lightbar and boom section control.

Access: SETUP FARMS ADVANCED CONNECT

Name	Button	Function
GPS		The GPS button will display the GPS Setup window.
AUTOSPRAY		The AUTOSPRAY button will display the AutoSPRAY Setup window.
LIGHTBAR		The LIGHT button will display the LIGHTBAR Setup window.
SWITCH		The SWITCH button will display the SWITCH Setup window.
BACK		The BACK button returns the system to the previous menu.

9.5.3.2 Guide

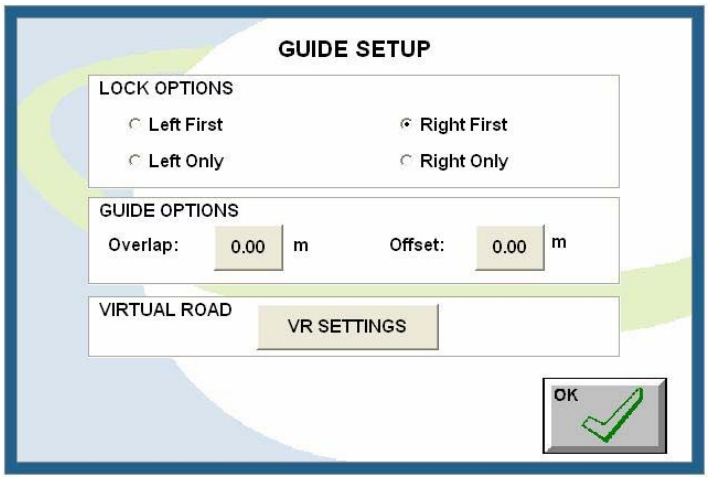


Figure 9-40: The Guide Setup Window

Overview: The GUIDE SETUP Window, see **Figure 9-40** allows the system to be configured for different guidance requirements.

Access: **SETUP** **FARMS** **ADVANCED** **GUIDE**

Name	Function
LOCK OPTIONS	The LOCK OPTIONS button determines the search pattern of the Lock guidance function.
GUIDE OPTIONS	The GUIDE OPTIONS buttons open the numerical keyboard for entry of the overlap and offset values.
VIRTUAL ROAD	The VR SETTINGS button opens the Virtual Road Setup window to configure the appearance of the Virtual Road.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

- **VIRTUAL ROAD SETUP**

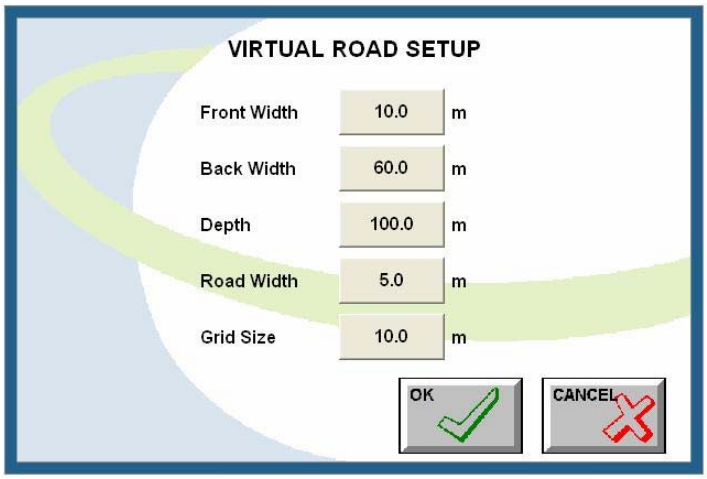


Figure 9-41: The Virtual Road Setup window

Overview: The VIRTUAL ROAD SETUP Window, see **Figure 9-41** allows the Virtual Road to be configured for different guidance requirements.

Access: **SETUP** **FARMS** **ADVANCED** **GUIDE** **VR SETTINGS**

Name	Function
FRONT WIDTH	The FRONT WIDTH button opens the numerical keyboard to enter the value of the front width of the Virtual Road.
BACK WIDTH	The BACK WIDTH button opens the numerical keyboard to enter the value of the back width of the Virtual Road.
DEPTH	The DEPTH button opens the numerical keyboard to enter the value of the depth of the Virtual Road.
ROAD WIDTH	The ROAD WIDTH button opens the numerical keyboard to enter the value of the road width of the Virtual Road.

Name	Function
GRID SIZE	The GRID SIZE button opens the numerical keyboard to enter the value of the grid size displayed in the Virtual Road window
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.3.3 Register

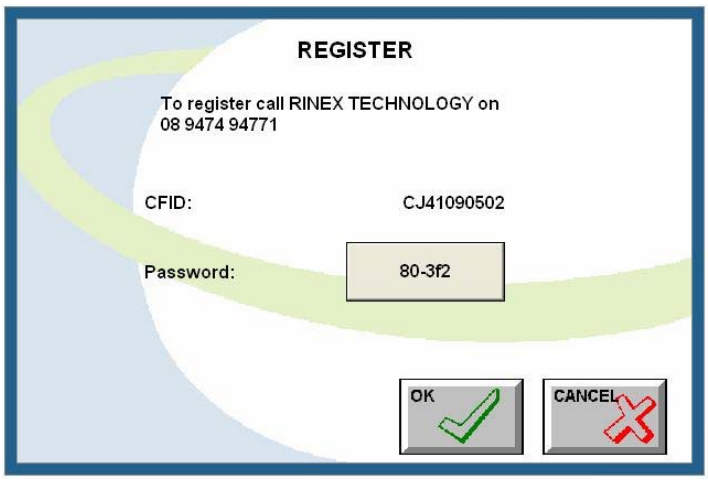


Figure 9-42: The Register window

Overview: The REGISTER Window, see **Figure 9-42** allows the registration of the software and the relevant options as purchased with the system. Contact RINEX if the registration details are not supplied with the system.

Access: **SETUP** **FARMS** **ADVANCED** **REGISTER**

Name	Function
PASSWORD	The PASSWORD button selects the keyboard to allow the password to be entered
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
Cancel	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.4 Connect – Sub Menu

The CONNECT Sub-menu allows configuration of settings that relate to devices connected to the Saturn “H” guidance system. Fore reference the CONNECT Sub-Menu buttons are illustrated in Figure 9-43.

Figure 9-43: The CONNECT Sub-Menu Buttons

9.5.4.1 GPS

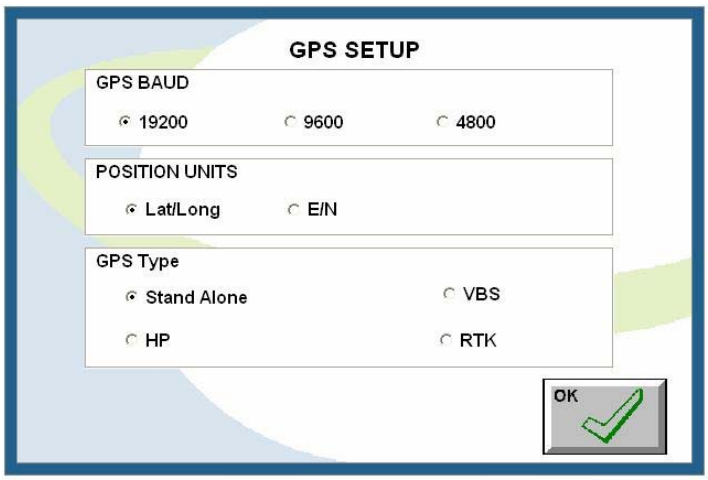


Figure 9-44: The GPS Setup window

Overview: The GPS SETUP Window, see **Figure 9-44** allows the system to be configured for different GPS receiver configurations.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **GPS**

Name	Function
GPS BAUD	The GPS BAUD options button allows receivers at a different baud rate to be used with the Saturn H series. The system will need to be restarted once the baud rate has been changed.
POSITION UNITS	The POSITION UNITS options button will display either Geographical (Latitude & Longitude) or Cartesian (Easting & Northing) coordinates on the status bar.
GPS TYPE	The GPS TYPE options button allows receivers of different capabilities to be used with the Saturn H series.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.5.4.2 AUTOSPRAY

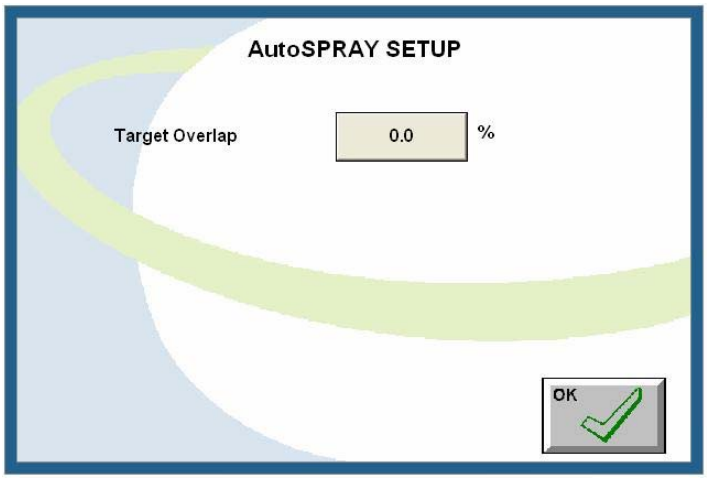


Figure 9-45: The AutoSPRAY Setup Window

Overview: The AutoSPRAY SETUP Window, see **Figure 9-45** allows the AutoSPRAY to be configured as required.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **AUTOSPRAY**

Name	Function
TARGET OVERLAP	The TARGET OVERLAP button selects the keyboard to allow the overlap value to be entered.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

9.5.4.3 LIGHTBAR

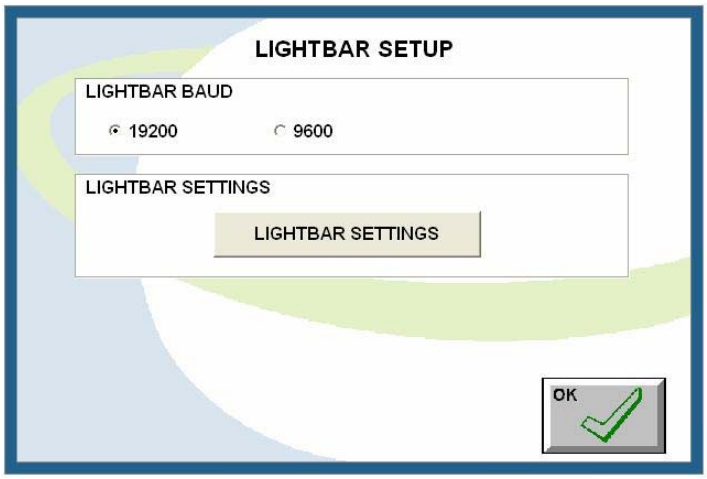


Figure 9-46: The Lightbar Setup window

Overview: The LIGHTBAR SETUP Window, see **Figure 9-46** allows optional lightbars to be configured as necessary for use with the Saturn H series.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **LIGHTBAR**

Name	Function
LIGHTBAR BAUD	The LIGHTBAR BAUD options button allows lightbars at a different baud rate to be used with the Saturn H series. The system will need to be restarted once the baud rate has been changed
LIGHTBAR SETTINGS	The LIGHTBAR SETTINGS button selects the lightbar settings window for configuration of the lightbar
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

- **LIGHTBAR SETTINGS**

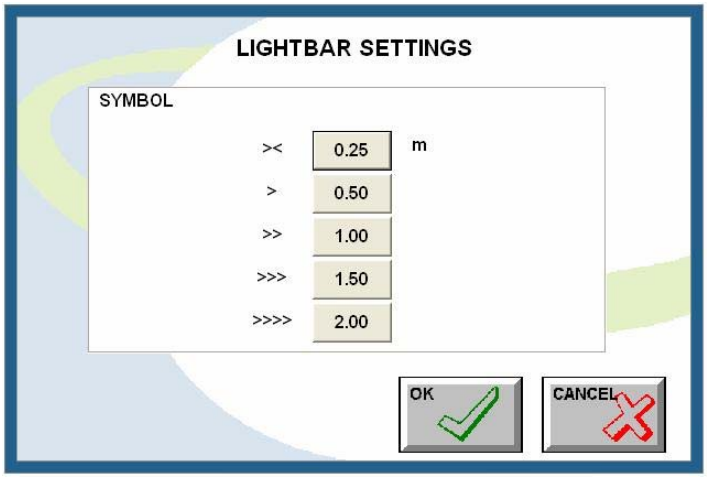


Figure 9-47: The Lightbar Settings Window

Overview: The LIGHTBAR SETTINGS Window, see **Figure 9-47** allows the lightbar to be configured for user preference.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **LIGHTBAR** **LIGHTBAR SETTINGS**

Name	Function
><	The >< button selects the keyboard for the value to be entered. The value must be greater than 0 and less than 100m.
>	The > button selects the keyboard for the value to be entered. The value must be greater than the>< value and less than 100m.
>>	The >> button selects the keyboard for the value to be entered. The value must be greater than the> value and less than 100m.
>>>	The >>> button selects the keyboard for the value to be entered. The value must be greater than the>> value and less than 100m.

Name	Function
>>>>	The >>>> button selects the keyboard for the value to be entered. The value must be greater than the>>> value and less than 100m.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.
CANCEL	The CANCEL button will ignore any selected actions, close the Window and return to the previous Menu.

9.5.4.4 SWITCH

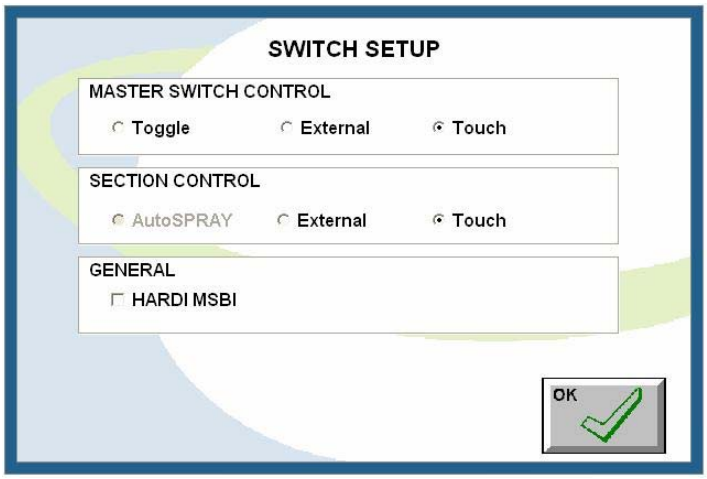


Figure 9-48: The Switch Setup window

Overview: The SWITCH SETUP Window, see Figure 9-48 allows the system to be configured with different switches for starting and stopping of recorded treatment data.

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **SWITCH**

Name	Function
MASTER SWITCH CONTROL	The MASTER SWITCH CONTROL options button selects the switch device that is used for starting and stopping of recorded treatments.
SECTION CONTROL	The SECTION CONTROL options button selects the device that is used for starting and stopping of individual boom sections treatments.
GENERAL	The GENERAL checkbox selects the mode used when operating the optional MSBI kit. The checkbox must be ticked for use with a HARDI spray rate controller.
OK	The OK button will update the selected actions, close the Window and return to the previous Menu.

10

AutoSPRAY

The AutoSPRAY controller is designed to connect to your existing Spray Controller and the Saturn “H” guidance system to provide automatic boom section control. This will greatly reduce the need for manually switching sections ON or OFF when going over previously sprayed crop or pasture. Its ability to automatically control the spraying state of the sections relieves the operator from an arduous task which requires split second timing on multiple switches. The AutoSPRAY controller can be interfaced with most existing spray rate controllers.

The AutoSPRAY controller can be used in many situations as shown in Figure 10-1.

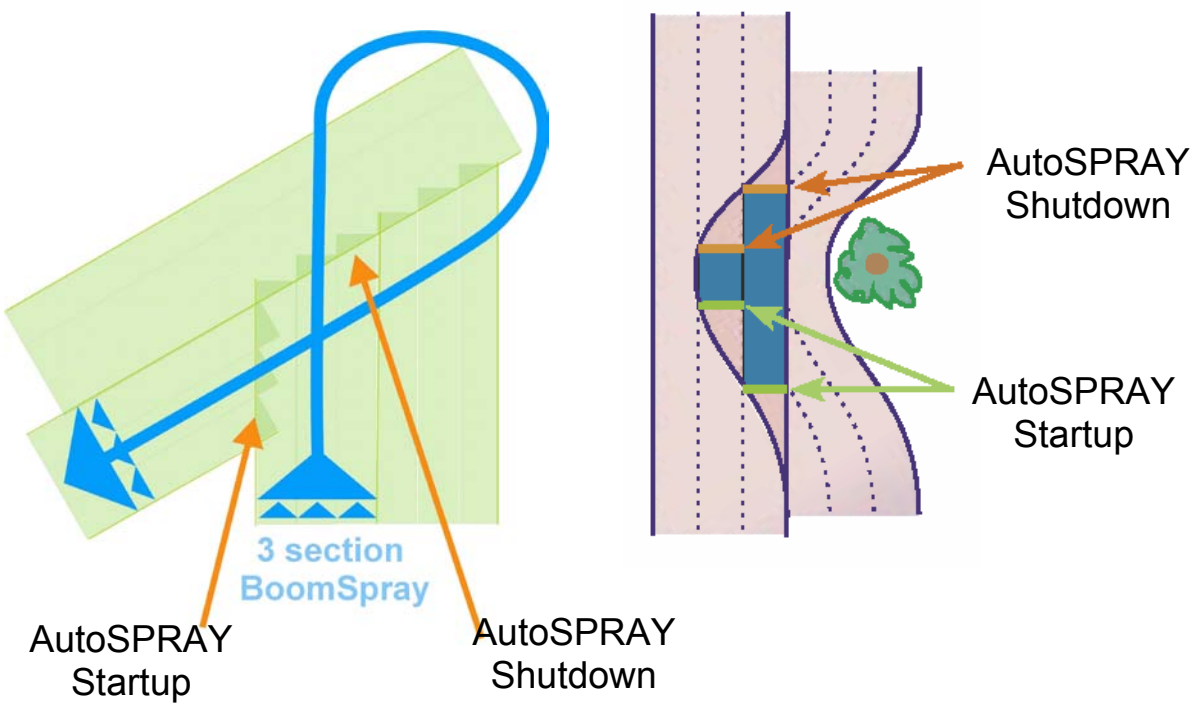


Figure 10-1 AutoSPRAY Uses

10.1 AutoSPRAY Overview

The AutoSPRAY is compatible with a wide variety of spray rate controllers and is easily installed. RINEX have a range of easy to install interface cables available for some of the more popular spray rate controllers on the market. RINEX also manufacture a generic AutoSPRAY cable which can be used in place of a controller specific cable and is therefore compatible with the full range of spray rate controllers as shown in Appendix 3. A schematic of the Saturn "H" system and AutoSPRAY controller is shown in Figure 10-2.

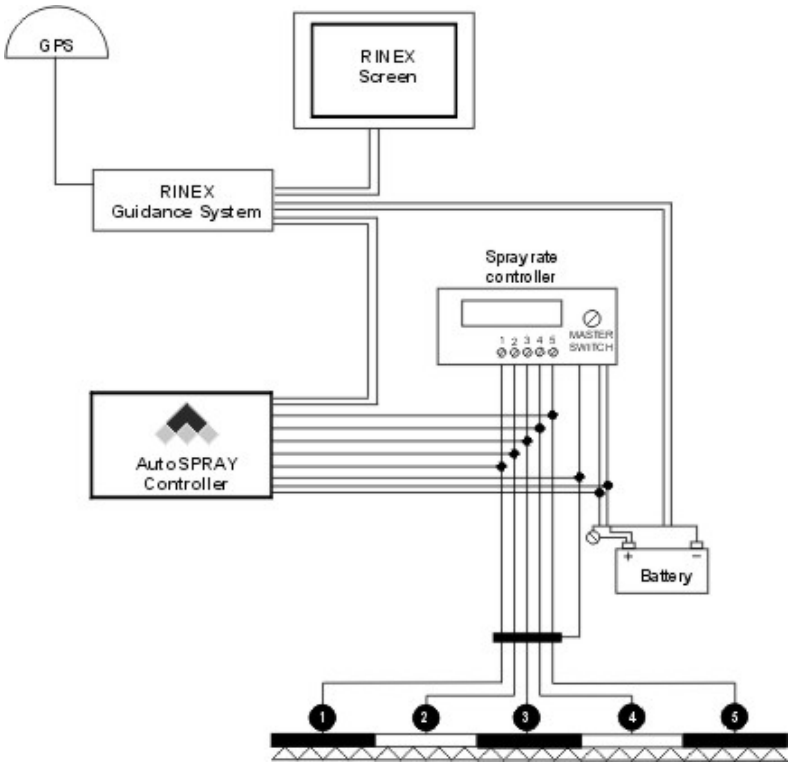


Figure 10-2 AutoSPRAY Overview

10.2 Configuring the AutoSPRAY

Prior to using the AutoSPRAY option it is necessary to ensure that the overall system is correctly configured to ensure that system accurately controls the spray rate controller.

10.2.1 Enabling the AutoSPRAY Option

In order to use the AutoSPRAY option it will be necessary to firstly enter the correct password and ensure that the option is enabled as described in Section 6.1.2.

The AutoSPRAY function is now enabled on the system and it can be switched ON & OFF as necessary via the Setup Options Window.

10.2.2 Setting AutoSPRAY Latency Values

The most critical parameter with AutoSPRAY is the latency value. Latency is the timing delay from when the switch status is toggled between ON and OFF, and to when the spray nozzle on the boom starts and stops spraying of the water and chemical mixture.

The latency value will vary between different spray rigs and is beyond the scope of this manual to describe why they vary. However the fact that they do vary is important and the values must be accurately determined. Furthermore the latency may vary between switching ON and Switching OFF, hence it is necessary to determine both values.

Once the latency values have been computed they are recorded with the Flow Controller that is associated with a rig as shown in Figure 10-3.

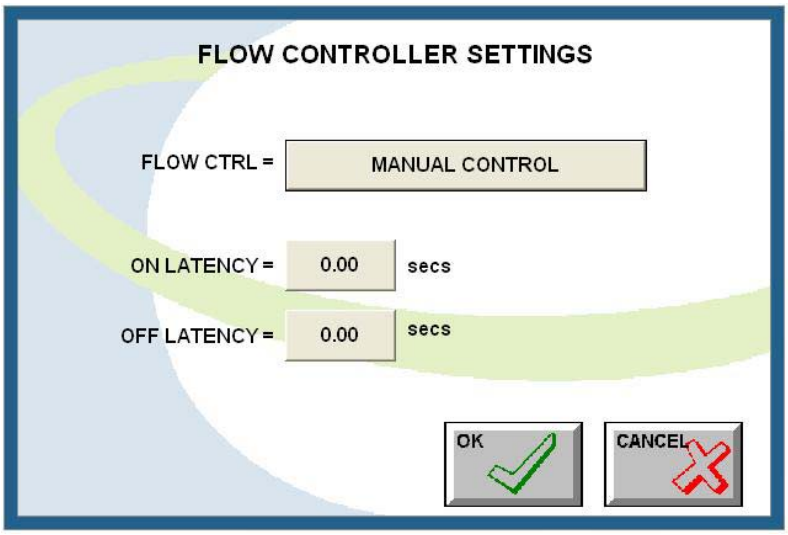


Figure 10-3: The Flow Controller Settings Window

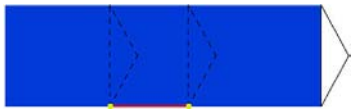
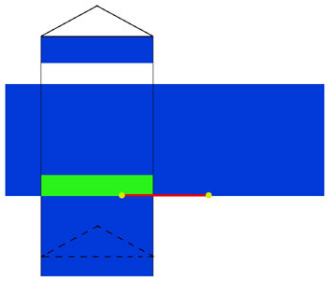
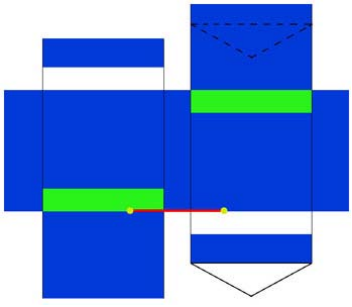
Overview: The Flow Controller Settings Window, see Figure 10-3 allows the system to be configured with different switches for starting and stopping of recorded treatment data.

Access: **SETUP** **FARMS** **VEHICLES** **RIGS** **NEW** **FLOW CONTROL**

10.2.2.1 Determining the AutoSPRAY Latency

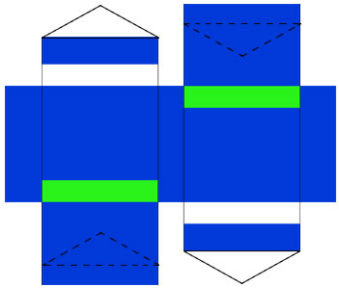
The quickest way to estimate the latency of the sprayer is to use a stop watch, turn a spray section on and time the delay between this action and when spray is coming out the nozzle on the boom. This may be a very small value (a few tenths of a second and hard to measure accurately).

For a more accurate measurement, use the following procedure:

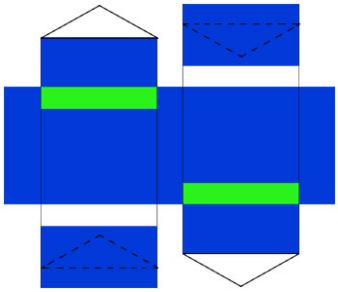
Step	Instruction	Diagram
1	Drive slowly in a straight line down the field for 200m with the sprayer on. The tank should have water only for the purpose of this exercise. Have another person mark the end nozzle of the boom with two pegs and a rope half way along the spray run.	
2	At right angles to the pervious spray run, spray at 20km/hr across the spray mark with one end of the boom crossing over the rope. Ensure that you have allowed enough distance before crossing over the line for the boom trailer to straighten up behind the tractor. Have someone measure the distance from the rope to where the sprayer actually reacted.	
3	Repeat step 2 in the opposite direction.	

Step	Instruction	Diagram
4	Metric Calculations If Speed(km/h) = The speed of the vehicle in kilometres per hour Distance(m) = The distance from the rope to where the sprayer reacted in metres. Calculate the latency using this formula: Latency(s) = Distance(m) ÷ Speed(km/h) x 3.6 For example Assuming the operator was travelling at 20km/hr and the distance from the rope to where the sprayer reacted is 5m: Latency(s) = 5(m) ÷ 20(km/h) x 3.6 = 0.9 seconds.	
5	Imperial Calculations If Speed(mph) = The speed of the vehicle in miles per hour. Distance(ft) = The distance from the rope to where the sprayer reacted in feet. Calculate the latency using this formula: Latency(s) = Distance(ft) ÷ Speed(mph) x 0.68 For example Assuming the operator was traveling at 12mph and the distance from the rope to where the sprayer reacted is 16ft: Latency(s) = 16(ft) ÷ 12(mph) x 0.68 = 0.9 seconds Often the latency time for the sprayer to switch on will differ from the time to switch off. Currently a compromise needs to be made and averaging the two results is the best figure to use.	
6	Repeat steps 1 to 4, altering the latency figure by plus or minus 0.1 seconds, until the optimum result is achieved.	

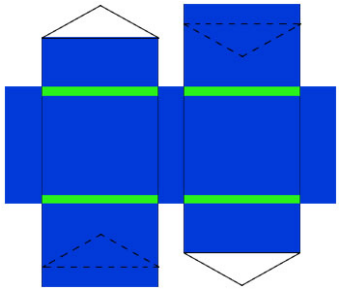
The following examples show possible scenarios and how to resolve the latency settings for optimum control of the AutoSPRAY.



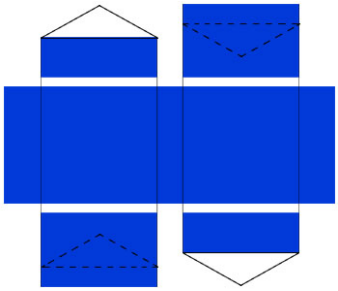
Latency set too low



Latency set too high



Optimum Latency setup



Abnormal situation, increase overlap

10.2.3 Setting AutoSPRAY Overlap

The AutoSPRAY can also control the overlap tolerance which is used to decide when to turn valves on or off. When set to its default of 0%, the system will turn the valves on whenever any part of the sensed area has not been sprayed. It is effectively the percent of miss that the system will tolerate. If the value is increased, the system will not turn the valves on when traversing over a small missed area such as a line between two spray swaths.

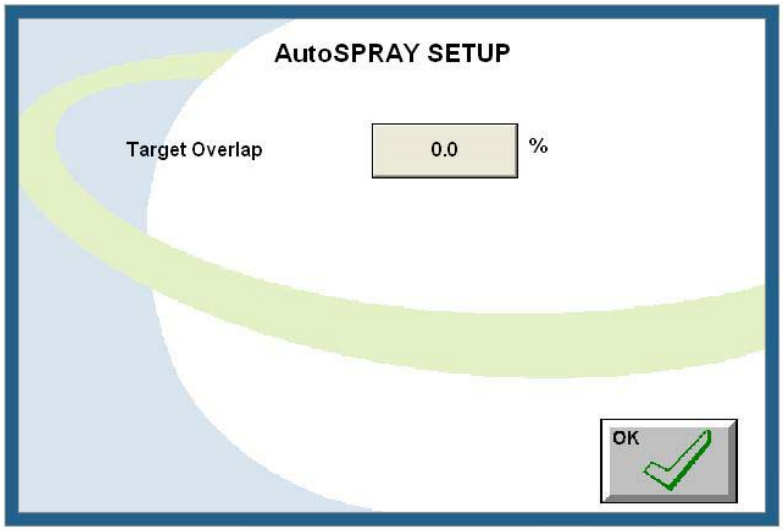


Figure 10-4 AutoSPRAY SETUP Window

Overview: The AutoSPRAY Setup Window, see Figure 10-4 allows the target overlap to be configured

Access: **SETUP** **FARMS** **ADVANCED** **CONNECT** **AUTOSPRAY**

10.3 Using AutoSPRAY in the Field

The following is a step by step guide to getting the RINEX AutoSPRAY up and running.

Step	Instruction
1	Start the Saturn “H” system by turning the vehicle ignition ON and the AutoSPRAY system attached. The system should be operational and ready to proceed as described in Section 2.
2	Check that the Power LEDs on the AutoSPRAY controller front panel is ON.
3	Turn the spray rate controller ON, all boom section switches are to be in the OFF position.
4	Turn the spray rate controller Master switch to the ON position.
5	Start to move the vehicle. The boom sections will automatically switch ON as the vehicle moves over a non-treated area and will switch OFF over a treated area which has been recorded by the system.
6	As the field is being treated, the Map Screen will show where intentional overlap has occurred and this will be green in colour as shown in Figure 10-5.
7	When the field has been completely treated, turn the master switch OFF.
8	If you wish to stop working, simply turn the vehicle ignition off to shutdown the entire system.
9	If you wish to continue working in a different field, see Section 2.4.1on starting a New Field.

When AutoSPRAY is being used to control the spraying state of the boom, the overlapped areas can be viewed on the Map Screen. The overlapped areas are displayed in green, the non-overlapped areas are displayed in blue and the non-treated areas are displayed in white. To view the overlapped areas, the view must be in North Up mode.

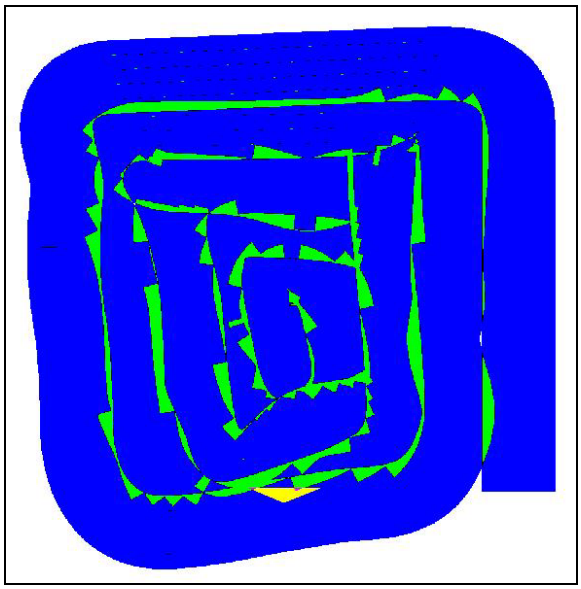


Figure 10-5: A Typical Map Screen with AutoSPRAY Overlap

10.3.1 Viewing the Percentage Overlap

The percentage of overlapped areas can be viewed as a field is treated as shown in Figure 10-6. This can be viewed on the lower status bar on the bottom of the map screen.

If the lower status bar is not showing the percentage overlap, tap it until it is displayed.

Figure 10-6: The percentage overlap on the status bar

11

AutoSTEER

The AutoSTEER option is an add-on to the RINEX guidance product range that allows the guidance system to AutoSTEER the vehicle along a straight line providing optimal accuracy.

11.1 Connecting the AutoSTEER Controller

Connecting the AutoSTEER Controller to the Saturn HT system is a simple process. Supplied with the AutoSTEER system is the AutoSTEER Controller Serial Interface Cable.

To connect the AutoSTEER Controller Serial Interface Cable., insert the circular 8 pin connector into the grey serial connector of the Internal Tractor Loom (The red power connector remains disconnected). Then insert the 9 pin connector into the GPS port of the Saturn HT. (See diagram below)

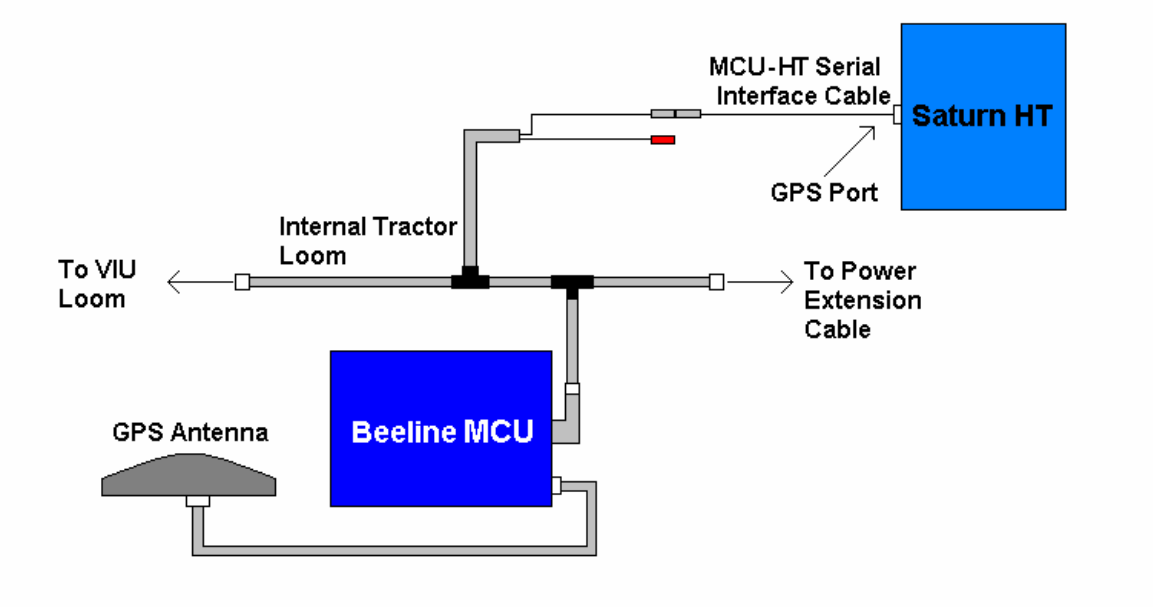


Figure 11-1: Connecting the AutoSTEER hardware to the Saturn HT

11.2 Enabling AutoSTEER

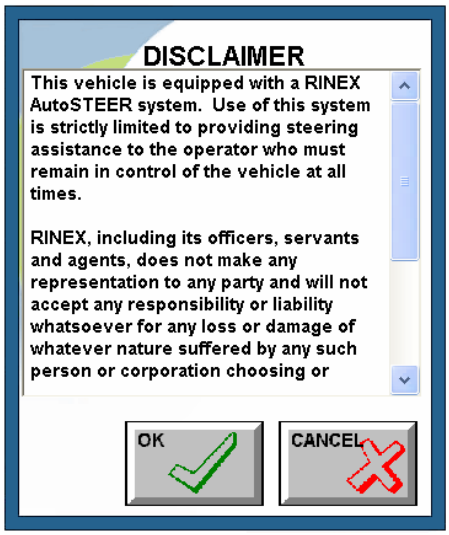
When the AutoSTEER controller has been fitted to you vehicle and connected to the Saturn HT, the option must be activated in the GuideTRAX software.

1) From the AutoSTEER Setup window (section 11.3) select AutoSTEER on by placing a tick in the box at the top of the window.

2) Now press OK. A window will be displayed informing you to restart the system.

3) Turn the vehicle ignition off, wait for the system to shutdown and then turn the vehicle ignition back on.

4) When the system starts up again, a disclaimer screen will be displayed. Read the information carefully and if you agree press OK, if you do not agree with this disclaimer, press cancel and the system will shutdown. The disclaimer will be displayed every time the system is started.


DISCLAIMER
This vehicle is equipped with a RINEX AutoSTEER system. Use of this system is strictly limited to providing steering assistance to the operator who must remain in control of the vehicle at all times.
RINEX, including its officers, servants and agents, does not make any representation to any party and will not accept any responsibility or liability whatsoever for any loss or damage of whatever nature suffered by any such person or corporation choosing or
OK
CANCEL

11.3 AutoSTEER Settings

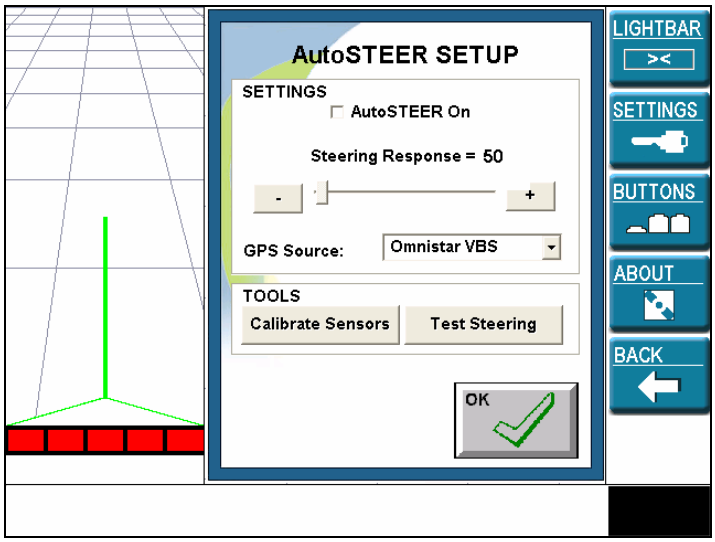
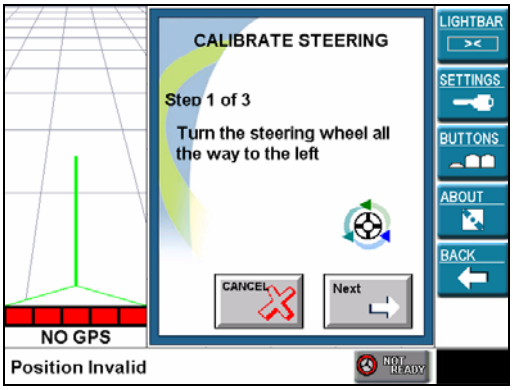
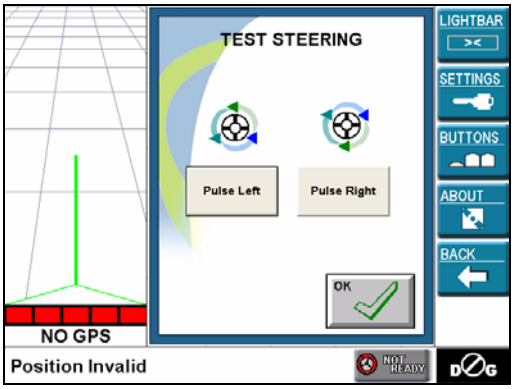


Figure 11-2: The AutoSTEER Setup Window

Overview: The AutoSTEER setup window allows the user to change various settings related to AutoSTEER. This window can be opened by tapping the AutoSTEER button in the General Setup window.

Name	Function
AutoSTEER ON	Selecting AutoSTEER On will enable the AutoSTEER option. If there is a tick in the check box next to AutoSTEER On then the option is on. Removing the tick will turn the option off. When this option is activated/ deactivated, the system must be shutdown and restarted for the settings to take effect.
Steering Response	◆ If the steering seems to be too slow or sluggish, it probably indicates that the steering response is too low and should be increased. ◆ If the steering seems to be too aggressive in maintaining the path, it probably indicates that the steering response is too high and should be decreased. To change the steering response, press the +/- buttons either side of the slider bar.

Name	Function
GPS Source	The type of GPS being received can be selected using the GPS Source drop down box. There are three sources currently supported: ◆ Omnistar VBS – Sub Metre ◆ Omnistar HP – Sub Decimetre ◆ RTK – Base stations To select the GPS Source, press the drop down arrow and select the correct type by touching it in the list.
Calibrate Sensors	The wheel angle sensors should be calibrated if they have been adjusted. This usually occurs if they have been replaced or damaged during use. To calibrate the wheel angle sensors, press the Calibrate Sensors button. This will display a three step wizard that will be a guide through the calibration process. You will be asked to turn the steering wheel all the way to the left, right, and to the centre.  **Figure 11-3: Calibrate Steering**

Name	Function
Test Steering	Test Steering can be used to verify that the steering is responsive to commands. ◆ Pressing Pulse Left should jolt the steering to the left. ◆ Pressing Pulse Right should jolt the steering to the right.  **Figure 11-4: Calibrate Steering**
OK	Selecting OK will close the window and changes will take effect.

Hints and Tips:

- *When calibrating the steering, the simplest way to align the steering wheel to the centre is to pick a point on the horizon and drive to it. When you feel that the steering wheel is in the centre and the vehicle is driving straight press next.*

11.4 The AutoSTEER Status Button

When AutoSTEER is on, a button will appear on the status bar at the bottom of the screen to the right. This button displays the current status of AutoSTEER. There are four states of operation when in AutoSTEER mode:

Status	Meaning	Action
	If an error occurs that is related to AutoSTEER then the AutoSTEER Status button will display ERROR.	Pressing the AutoSTEER Status Button when it shows ERROR will do nothing.
	If there is no guideline set, the vehicle is stationary or too far from the guideline, the AutoSTEER Status button will display NOT READY	Pressing the AutoSTEER Status Button when it shows NOT READY will do nothing.
	When GPS is good, the guideline has been set and the vehicle is moving along the guideline then the AutoSTEER Status button will display READY	Pressing the AutoSTEER Status Button when it shows READY will activate AutoSTEER and the vehicle will begin to steer automatically. The AutoSTEER Status Button will then change to show ON.

Status	Meaning	Action
	When AutoSTEER is active and the vehicle is steering automatically the AutoSTEER Status button will display ON	Pressing the AutoSTEER Status button when it shows ON will deactivate AutoSTEER and the vehicle will no longer be steering automatically. The AutoSTEER Status Button will change to show READY

Figure 11-5: The AutoSTEER Status Button

11.5 The AutoSTEER Status Window

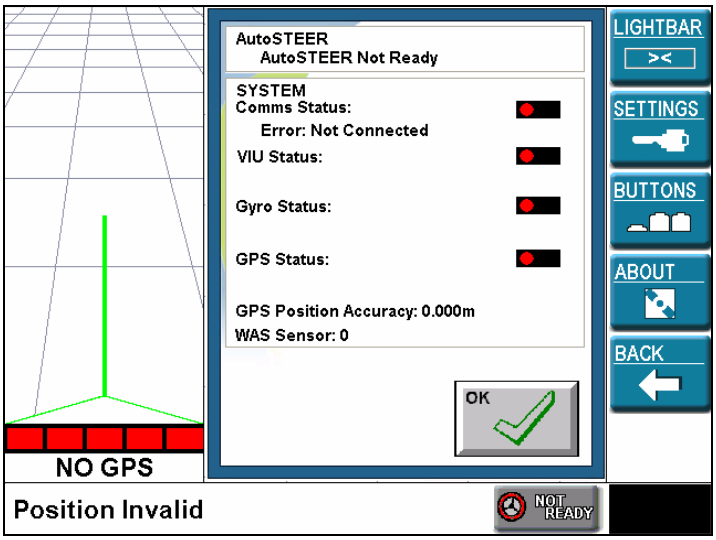
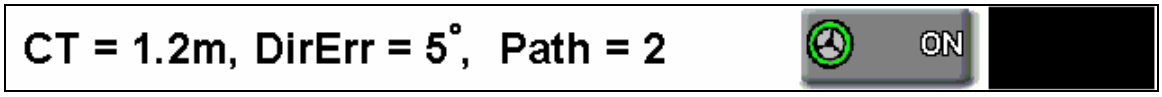


Figure 11-6: The AutoSTEER Status Window

Overview: Pressing the AutoSTEER Status button in the GPS Info window (section **Error! Reference source not found.**) will display the AutoSTEER Status window that contains error and status information that will help in determining any problems. If an error occurs, see the trouble shooting section of this manual to decode the error numbers listed in this window.

11.6 The AutoSTEER Status Bar

Other status information related to AutoSTEER can be viewed on the lower status bar. To view this information, touch the status bar until it displays the correct information.



- Dir Err — The Dir Err (Direction Error) indicates the direction the vehicle is travelling relative to the guideline. This is an angle displayed in degrees.
- Ctk Err — The Ctk Err (Crosstrack Error) indicates the distance the vehicle is from the guideline in metres.
- Path — The Path number indicates how many guidelines the current guideline is away from the original guideline.

11.7 Setting the Guide Points

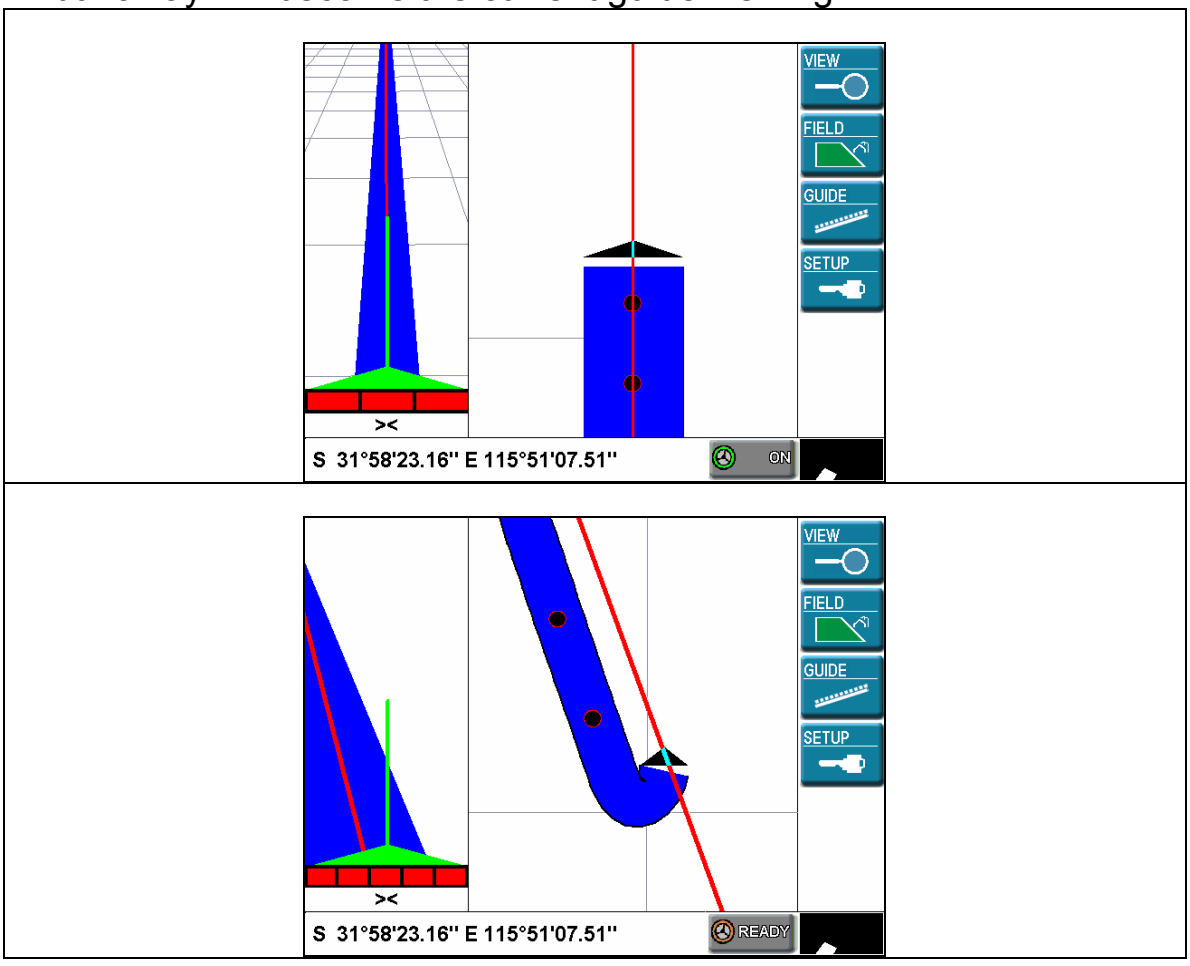
In order for AutoSTEER to become READY, the guide points must be set in the paddock. The guide points can be set using the Point A/Point B button in the Guide Menu.

1) When the vehicle is in the desired position for the first guide point, press Point A

2) Drive for at least 20m and when the vehicle is in the desired position for the second guide point, press Point B. The further this distance, the more accurate the direction of the line will be. Ideally, place Point A at one end of the field and then Point B at the other end of the field.

3) Now press Parallel

The guideline will now be ready for use with AutoSTEER. As you move away from the current guideline, the next guideline exactly one swath width away will become the current guideline. E.g:



11.8 Activating AutoSTEER

To achieve the AutoSTEER READY state, a number of conditions must be met.

1) Guideline must be set.
2) Vehicle must be traveling parallel to the guideline.
3) Vehicle must be within 2m of the guideline.
4) Vehicle must be traveling between 1 and 29 km/hr.
5) If using VBS, the GPS position accuracy must be below 1.5m. If using HP, the GPS position accuracy must be below 0.5m. If using RTK then the GPS position accuracy must be below 0.1m. This can be viewed in the AutoSTEER Status window.
6) When the above conditions have been met, hands must be removed from the steering wheel.

When all of the above conditions have been met, the AutoSTEER status button which is displayed on the right hand side of the status bar will change to READY.

When the AutoSTEER status button is pressed while displaying READY, AutoSTEER will become active and the vehicle will start to steer automatically down the guideline. The AutoSTEER status button will display ON when AutoSTEER is activated.

11.9 Deactivating AutoSTEER

Once AutoSTEER is ON, there are various methods of deactivating.

1) Move the steering wheel.
2) Stop the vehicle or decrease speed to less than 1km/h.
3) Press the AutoSTEER status button when it is displaying ON.
4) Press Guide Off or Lock in the Guide Menu.

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APPENDIX

APPENDIX 1 Terminology

Phrase	Description
AutoSPRAY	AutoSPRAY is an optional extra in the RINEX guidance product range that allows the Saturn HT system to control the spraying state of the boom as the vehicle drives over a treated/non-treated area.
AutoSTEER	AutoSTEER is an optional extra in the RINEX guidance product range that allows the Saturn HT system to steer automatically along a straight line using parallel guidance providing optimal accuracy.
Boom Settings	Boom details such as the number of boom sections and the width of each section.
Button	A symbol representing a function shown on the touch screen which allows the input of data or performs a function when tapped.
Current Field	The current selected field in memory (chosen from the Memory window). The current field is where all of the treatment data will be stored when treatment is commenced.
DGPS	Differential Global Positioning System. Provides more accurate positioning information where corrections are applied to the basic GPS position.
External Button Box	An optional device that is connected to the USB port of the Interface Box. This device consists of four programmable buttons that can be used with the GuideTRAX program to perform functions without having to touch the screen.
Field	A file in which treatment data is recorded and saved.

Phrase	Description
GPS	Global Positioning System. Provides basic position information to the system.
Guideline	The red line displayed on the map screen. This line may have been created by either lock or parallel guidance.
Guide Points	A set of two positions used to compute the set of parallel guidelines when using parallel guidance.
GuideTRAX Software	The software program produced by RINEX which runs on the Saturn HT system.
Launcher Program	The utility program produced by RINEX which is installed on the Saturn HT system and is used to run GuideTRAX and maintain the system.
Lightbar	An LED device that is connected to the lightbar port on the Saturn HT system that displays directional information to the operator which is typically mounted in the line of sight of the operator.
Link	Component of the vehicle measured from one pivot point to another.
Link Settings	Link details such as the number of links, the link distances and the axle distances.
Lock Guidance	The type of guidance used when working the field in either a race track or contour method.
Map Screen	The area of the screen displayed to the left of the menu buttons which displays the treatment data, the vehicle position marker and the guideline.
Menu	A group of related buttons shown to the right of the touch screen display which allow access to other menus or functions.

Phrase	Description
Multi Section Boom Interface (MSBI)	A device that is connected to the controller port on the Saturn HT system that provides an interface to the spray controller. The MSBI allows GuideTRAX to read the current status of each boom section on the spray controller and displays the status on the screen along with the treated area for each section.
Parallel Guidance	The type of guidance used when working the field in an up and back method. A set of parallel guidelines will be drawn on the screen one swath width apart.
PC	The PC device, running the Microsoft Windows® operating system, and the GuideTRAX software.
Saturn Hardware	The hardware system installed in your vehicle cabin which is used to run the GuideTRAX software. That is the Interface Box, GPS antennae and can include any connected device, cables, connectors and the touch screen.
Saturn HT Interface Box	The Interface Control Box. The main component of the Saturn HT system that provides an interface to other components of the system. It contains the PC board and is used to connect components such as the touch-screen and the GPS receiver.
Swath Width	The total width of the boom/implement.
Tap	To touch the touch screen once with your finger at an intended position on the screen. Care must be taken to tap the screen gently.
Toggle Switch	A device that is connected to the controller port on the Saturn HT system that allows the treatment to be turned on or off without having to touch the VPM on the screen.

Phrase	Description
Touch-Screen	The display device which shows the progress of your operation and accepts commands by tapping buttons on the screen.
Treatment	Refers to the spraying state of the boom. If treatment is on, then the spraying state of the boom is on and treatment data will be recorded in the current field. If treatment is off, then the spraying state of the boom is off and treatment data is not recorded.
Treatment Data	The position information stored in a field when treatment is on. The treatment data is represented on the screen as a blue shaded area.
Unit	The measurement unit used to evaluate mass, volume, area, distance etc (E.g. Kilogram, Tonne and Litre)
USB Storage Device	A device that is connected to the USB port on the Saturn HT system that is used to transfer files to and from the system.
Vehicle Position Marker (VPM)	The triangle symbol displayed on the map screen which represents the vehicle as it moves around the field.
Virtual Road (VR)	The VR is displayed to the left of the map screen. It is used to display the projected road that must be taken to follow the current guideline.

APPENDIX 2 SATURN GUIDANCE SYSTEMS

The Saturn “H” series can be easily identified by its compact interface box as shown in XXXXXXXX.

XXXXX The Saturn “H” interface box

The physical properties of the Saturn “H” series interface box are as follows

230 (w) x 65 (h) x 190 (d)

1200gm

The predecessor to the Saturn “H” series was the “G” series which incorporated different physical functionality. The GuideTRAX v3.0 (version 3.0) software has been adapted to operate on the “G” series with some slight differences which will be denoted in this manual as necessary.

Primarily the only difference that the user will note is the powering of the system. Whereas the “H” series incorporated the intelligent power supply which senses the status of the vehicle ignition, the “G” series must be manually switched ON and OFF.

The Saturn “G” series interface box as shown in XXXXX.

XXXX: The Saturn “G” interface box

The physical properties of the Saturn “H” series interface box are as follows

230 (w) x 65 (h) x 300 (d)

4300gm

APPENDIX 3 COMPATIBLE AUTOSPRAY CONTROLLERS

Compatible spray rate controllers	
Farmscan 2400 (2403 boom controller)	Raven 4x0 series
Farmscan 2400 (2405 boom controller*)	Raven 5x0 series
Farmscan 24v1	Raven 6x0 series
John Deere SprayStar	TeeJet 844
Mid Tech TASC series	TeeJet 844 E
Mid Tech ARC series	

* There are some variations to these models, check with your local dealer

APPENDIX 4 SYSTEM MESSAGES

Message	Probable Cause	Try This…
Could not find lock! Move and try again.	Vehicle is too far away from the previous track. Lock method may be set to 'Left Only' or 'Right Only'.	Move within 1½ swath widths of the track from which you want to follow. Check lock direction setting from Guide Setup (Section 5.6.2).
Points too close! Move and try again.	Parallel Point B was set too close to Point A.	Move the vehicle and set Parallel Point B again.
Key line already defined! Delete line?	A parallel line has already been set. System checks to make sure you want to delete the parallel line when you try to create a new one.	Press Ok if you wish to delete the current parallel line and create a new one. Press cancel if you want to keep working on the current parallel line.
Could not open port:	Another program or device is occupying the communications port.	Try closing/disconnecting the device. If there is nothing that appears to be occupying the port, try restarting the computer.
Please stop treatment before going to field menu	Treatment was on when the field menu button was pressed. When in the FIELD menu the GPS information is ignored so treatment cannot be recorded while in the field menu.	Turn treatment off and press the Field menu button again.

Message	Probable Cause	Try This…
Load aborted by user	Cancel button was pressed on the load screen while a field was being loaded.	If you wish to reload the full field, either restart the program or press Memory in the Field menu and select the correct field (Section 9.2.3).
Current position out of limit. Please restart treatment!	There is an invisible boundary with a radius of 10km in which spraying can occur in each field once spraying has commenced. When the boundary is crossed, this message will be displayed and treatment cannot continue.	If you wish to keep the current treatment for completion, do not restart it, simply drive back to where you left off and the treatment can continue. Else, if you wish to start another treatment, restart the field or select a different field from the field memory window (Section 9.2.2).
This unit is not registered!	The system has not been registered for use.	Please contact RINEX for further information.
File Copied Successfully!	You have just saved a file and it has been saved to the transfer directory with no problems.	No action necessary.
Please restart system for changes to take effect:	System setting was changed and system must be restarted for the change to take effect.	Restart the program by pressing turning the ignition off and then turn the ignition back on.
Warning: Disk space is low.	Too many files have been saved and disk space is low.	Delete some files from Transfer directory located in the C drive.

Message	Probable Cause	Try This…
Error No disk space available	Too many files have been saved and there is no disk space remaining.	Delete some files from the Transfer directory located in the C drive.
Error: The current position is invalid, (No valid GPS)	A parallel point was attempted to be placed while there was no GPS.	Try placing a new parallel point when GPS returns.
Warning: All data in the current field will be lost. Do you wish to proceed?	A field has been loaded into the current field and the current field must be cleared for this to occur.	If you wish for the selected field to be loaded in to the current field, press ok. Else, if you wish to load the selected field into a different field, press cancel, open the correct field and then select the field for loading again.

Problem	Probable Cause	Try This…
System does not draw a "track" behind the vehicle	Vehicle marker is not switched to the ON state	Check in Comms Setup (Section 5.6.2) to ensure the correct method of switching (toggle, touch or multi-boom) is selected.
Guide line is drawn in wrong place	An offset, or overlap value has been incorrectly entered.	Ensure overlap and offset values are correctly entered in Guide Setup (Section 5.6.2).
Calculated total area is incorrect	Did not return to original start point after one complete lap.	Area will not be calculated unless field is restarted and perimeter is recorded.
Calculated treated area is incorrect.	Swath width is set incorrectly.	Restart field and change swath width to correct value (Section **Error! Reference source not found.**).
Toggle switch or boom controller will not turn spraying on/off	Incorrect controller is selected	Change controller via the Comms Setup (Section 5.6.2). If unable to change controller, restart field.
Error while writing to disk.	There has been an error while writing to a file or saving a file.	Try saving or restarting the field again.
Error reading file:	There has been an error in the file you are attempting to use.	Restart the field via the Field menu (Section **Error! Reference source not found.**).
Comm Error: Check cable connection.	There is a problem in the cabling or a cable has become disconnected.	Check that all cables are inserted correctly.

Problem	Probable Cause	Try This…
Range Error:	A value has been entered that is too large or too small	Enter another value that is within the range that is displayed in the error message.
Error Copying File:	An error occurred when a file was loaded.	Try restarting the current field and reload the file. If it occurs again, the file is corrupt. Please delete the file to avoid further complications.

APPENDIX 5 AUTOSTEER MESSAGES

Message	Meaning	Action
Not Connected	Cable has been disconnected from the AutoSTEER Controller or the GT.	Reconnect cable.
200-12	Local GPS Receiver bad device.	Reboot system. If problem persists contact RINEX.
201-0	Local GPS Receiver temperature is above the normal operating range (100ºC).	Contact RINEX
201-1	Local GPS Receiver temperature is below the normal operating range (-40ºC).	Increase the temperature in the cab.
202-0	Local GPS Receiver supply voltage is above the normal operating range (16.0vDC).	Check input voltage from tractor. The voltage should be between 10vDC and 15vDC.
202-1	Local GPS Receiver supply voltage is below the normal operating range (7.0vDC).	Check input voltage from tractor. The voltage should be between 10vDC and 15vDC.
203-9	Local GPS Receiver L1 signal update abnormal.	Reboot system. If problem persists, contact RINEX.
204-9	Local GPS Receiver L2 signal update abnormal.	Reboot system. If problem persists, contact RINEX.
205-0	Local GPS Receiver CPU load above normal operating range.	Reboot system. If problem persists contact RINEX.
206-5	GPS Antenna open circuit.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.

Message	Meaning	Action
206-6	GPS Antenna short circuit.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.
206-9	GPS Antenna failure.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.
207-0	Gyro internal temperature above normal operating range (85ºC).	Contact RINEX.
207-1	Gyro internal temperature below normal operating range (-45ºC).	Ensure temperature in cab is above -45ºC. If problem persists contact RINEX.
208-9	Abnormal Gyro data update rate.	Reboot system. If problem persists, contact RINEX.
210-12	Base GPS Receiver bad device.	Reboot system. If problem persists contact RINEX.
211-0	Base GPS Receiver temperature above normal operating range (100ºC).	Contact RINEX.
211-1	Base GPS Receiver temperature below normal operating range (-40ºC).	Increase the temperature in the cab.
212-0	Base GPS Receiver supply voltage above normal range (16VDC).	Check input voltage from tractor. The voltage should be between 10VDC and 15VDC.
212-1	Base GPS Receiver supply voltage below normal range (7VDC).	Check input voltage from tractor. The voltage should be between 10VDC and 15VDC.
213-9	Base GPS Receiver L1 signal update abnormal.	Contact RINEX.
214-9	Base GPS Receiver L2 signal update abnormal.	Contact RINEX.

Message	Meaning	Action
215-0	Base GPS Receiver CPU load above normal operating range.	Reboot system. If problem persists contact RINEX.
216-5	Base GPS Antenna open circuit.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.
216-6	Base GPS Antenna grounded circuit.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.
216-9	Base GPS Antenna failure.	Check cabling to GPS Antenna. Contact RINEX – The antenna may need to be replaced.
232-2	GPS erratic, intermittent or incorrect.	Check cable connections. Ensure that Omnistar subscription hasn't expired. Check GPS status by touching the scrolling satellite. If problem persists contact RINEX.
300-12	GPS AGC bad component	Contact RINEX.
302-0	Gyro Yaw sensor above normal operating range.	Reboot system. If problem persists, contact RINEX.
302-11	Gyro Yaw sensor below rate of change when stationary.	Reboot system. If problem persists, contact RINEX.
303-1	WAS below normal operating range.	Check all cables connected correctly. Check the isolation switch on the MCU. If problem persists contact RINEX.
303-2	Digital output error.	Check solenoid connections. Allow to cool. If problem persists, contact RINEX.

Message	Meaning	Action
303-7	JDT steering system not connected.	Ensure that it is connected. If problem persists contact RINEX.
303-9	VIU update rate poor.	Ensure the isolation switch on the MCU is on. If not switch off and on. If problem persists, contact RINEX.
303-13	JDT system not calibrated.	Contact RINEX.
304-0	GPS error above normal operating range.	Wait until GPS is good again. If problem persists contact RINEX.